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3 March 2011

Ms. Lauri Kemper  
Assistant Executive Officer  
California Regional Water Quality Control Board - Lahontan Region  
2501 South Lake Tahoe Boulevard  
South Lake Tahoe, California 96150

Subject: Addendum #2 to the Feasibility Study  
Pacific Gas and Electric Company Compressor Station  
Hinkley, California

Dear Ms. Kemper:

Pacific Gas and Electric Company (PG&E) has prepared this Addendum #2 to the Feasibility Study (FS) for the PG&E Compressor Station in Hinkley, California (Site). Addendum #1 was submitted on 31 January 2011 and addressed the comments presented by the California Regional Water Quality Control Board – Lahontan Region (Water Board) in their 10 January 2011 letter. In Addendum #1, two new remedial alternatives were presented and evaluated (Combined Alternatives and the preferred alternative, Alternative 4A). As stated in Addendum #1 and as discussed with Water Board staff, PG&E and its consultants have continued efforts to improve this preferred alternative, specifically to incorporate measures to reduce the remediation timeline.

The improved alternative that has been developed is termed Alternative 4B, and is outlined in this Addendum #2. Alternative 4B reduces cleanup time significantly when compared to the previous alternatives. A brief overview of Alternative 4B follows.

## **DESCRIPTION OF ALTERNATIVES 4A AND 4B**

### **Alternative 4A – Aggressive In-situ Treatment and Beneficial Agricultural Use (Addendum #1)**

Alternative 4A is a more aggressive form of Alternative 4 presented in the 30 August 2010 FS (Haley & Aldrich 2010a), expanding the in-situ reactive zone (IRZ) and agricultural unit (AU) remediation components to reduce the Alternative 4 remediation time frame. Table 1 highlights the major differences in Alternatives 4, 4A, and 4B, and summarizes the anticipated time to meet potential remedial milestones. As noted in Table 1, the estimated duration to achieve background concentrations for Alternative 4A decreased significantly (by 50 percent for the 3.1 micrograms per liter [ $\mu\text{g/L}$ ] hexavalent chromium [ $\text{Cr(VI)}$ ] background value) compared to Alternative 4. Alternative 4B further reduces the anticipated remedy duration.

### **Alternative 4B – Aggressive In-situ Treatment and Beneficial Agricultural Use with Targeted Pumping**

As discussed in meetings with the Water Board in January and February 2011 regarding Alternatives 4 and 4A, additional adjustments to IRZ and AU treatment approaches were made and modeled to evaluate the potential to further reduce the remedy duration. A new alternative (Alternative 4B), similar to Alternative 4A in overall approach, was developed. Table 1 identifies the major remedy components, and highlights the primary differences among Alternatives 4, 4A, and 4B. Alternative 4B uses much of the same general infrastructure as does Alternative 4A, but relies on a series of step-wise optimizations that refocus the remediation effort on the more “recalcitrant” areas of the chromium plume.

Below is a list of the major components of Alternative 4B, with optimizations over time noted for each remediation component. Refer to Figures 2a and 2b (collectively referred to as “Figure 2”, unless otherwise noted) for the conceptual well layout for each optimization period.

- Northwest injection of up to 80 gallons per minute (gpm);
- Extraction of groundwater for application at three existing AUs and three new AUs;
  - Year 10 Optimization: Install 12 new extraction wells and shut down two existing extraction wells
- Far-field carbon-amended injection IRZ utilizing groundwater extracted from the existing South Central ReInjection Area (SCRIA) extraction area, and injecting the dosed water into the SCRIA;
  - Year 5 Optimization: Turn off select SCRIA injection wells; distribute dosed water to SCRIA and Source Area injection wells
  - Year 10 Optimization: Install three new extraction wells and install one new injection well
  - Year 20 Optimization: Turn off select extraction wells (three in total); Modify IRZ application from continuous to intermittent (e.g., 4 months per year) and low concentration carbon-amended water is applied to select SCRIA/Source Area injection wells (39 in total)
- Near-field recirculation IRZ in the Central Area (expanded horizontally and vertically) and Source Area;
  - Year 5 Optimization: Convert select Source Area extraction wells to injection wells (six wells), and apply portion of dosed water from SCRIA Extraction area to Source Area; shut off southern Source Area injection wells
  - Year 10 Optimization: Install two new injection wells in Source Area
  - Year 20 Optimization: Turn off Central Area IRZ; Modify IRZ application from continuous to intermittent (e.g., 4 months per year), application of low concentration carbon-amended water to select SCRIA/Source Area injection wells (39 in total)
- Over time, optimization/modification of the initial (i.e., year 0) system configuration of Alternative 4B would include, for example, shutting down or converting extraction wells to injection points for certain IRZ recirculation zones in the Source Area, Central Area, and/or plume core as the areas respond to treatment as shown on Figure 2.

The initial system configuration of Alternative 4B mimics Alternative 4A as presented in FS Addendum #1 (PG&E, 2011), up through year 10 of operation. After year 10, Alternative 4B includes 12 new focused extraction wells in the vicinity of the plume toe, in addition to the extraction and injection wells installed for Alternative 4A optimizations. These 12 new extraction wells will provide 100 gpm of withdrawal for application on AUs located in the distal portion of the plume; this flow will replace 100 gpm from two existing extraction wells that will be shut down. The 12 new extraction wells, which will be located in areas of the plume toe that are recalcitrant to cleanup (based on modeling of Alternative 4A), will remain operating at 100 gpm until background concentrations have been achieved.

Modeling of Alternative 4B, including 12 new extraction wells targeting groundwater extraction in the plume toe after year 10, indicates a decrease in the estimated remediation duration to background concentrations (3.1  $\mu\text{g/L}$ ) by over 45 percent compared to Alternative 4A, and by over 70 percent compared to Alternative 4.

#### Duration and Cost

Below is a summary of the anticipated time and cost to meet potential remedial milestones for Alternatives 4A and 4B. Table 2 is a summary of the estimated time and costs to reach chromium remediation goals for all the alternatives evaluated in the FS, Addendum #1, and Addendum #2. Table 3 includes supplemental details for the cost estimates.

		Alternative 4A	Alternative 4B
<b>MCL Cr(T) 50 ug/L</b>	Years	6	6
	Non-Discounted Cost	\$36.1M	\$36.1M
	NPV Cost	\$34.0M	\$34.0M
<b>Maximum Background Cr(VI) 3.1 ug/L</b>	Years	75	40
	Non-Discounted Cost	\$142M	\$109M
	NPV Cost	\$78.7M	\$75.9M
<b>Average Background Cr(VI) 1.2 ug/L</b>	Years	130	95
	Non-Discounted Cost	\$203M	\$176M
	NPV Cost	\$81.5M	\$84.9M

Figure 1 summarizes the operating periods of the active remediation components (AUs and IRZs) and the estimated timeframes to reach the background remedial goals for the alternatives that were evaluated in the FS, Addendum #1, and Addendum #2. Figure 2 illustrates the well layouts for the various Alternative 4B operational periods. Appendix A includes a detailed evaluation of Alternative 4B relative to the Site-specific remedial objectives outlined in the FS. Appendix B includes the output of the predictive modeling for Alternative 4B.

## SUMMARY

Based on the evaluations included in the FS, Addendum #1, and Addendum #2, and considering the estimated time to achieve chromium remediation goals, comparative ease of implementation, and cost, Alternative 4B is the preferred alternative. This alternative applies effective technologies to areas where they would be the most productive, while generating the least amount of negative impacts.

We appreciate the opportunity to present this additional alternative to the Water Board. PG&E will continue to work on further remedial optimization both prior to and during remedial implementation. However, for the purpose of selecting a final remedy, we propose that the FS is now complete. We look forward to working with the Water Board in the evaluation and selection of a final remedy at Hinkley. If you have any questions, please do not hesitate to contact me.

Sincerely yours,



Eric Johnson  
Principal Remediation Specialist

c: Lisa Dernbach/RWQCB Lahontan Region, South Lake Tahoe  
Mike Plaziak/RWQCB Lahontan Region, Victorville

### Attachments:

- Table 1 – Alternatives 4, 4A, and 4B Comparison Table
- Table 2 – Estimated Time and Costs to Reach Chromium Remediation Goals
- Table 3 – Supplemental Details for Cost Estimate
- Figure 1 - Remedial Alternative Summary – Active Remediation Components and Durations
- Figure 2a – Alternative 4B Aggressive In-Situ Treatment and Beneficial Agricultural Use with Targeted Pumping Conceptual Well Layout
- Figure 2b – Alternative 4B Aggressive In-Situ Treatment and Beneficial Agricultural Use with Targeted Pumping Conceptual Well Layout
- Appendix A – Detailed Evaluation of Alternative 4B
- Appendix B – Groundwater Modeling Output for Alternative 4B

## REFERENCES

1. Haley & Aldrich, Inc. 2010a. Feasibility Study, Pacific Gas and Electric Company, Hinkley Compressor Station, Hinkley, California. 30 August.
2. Haley & Aldrich, Inc. 2010b. Hinkley Feasibility Study Supplemental Data Submittal. 14 October.
3. Pacific Gas and Electric Company (PG&E). 2010. Addendum #1 to the Feasibility Study, Pacific Gas and Electric Company, Hinkley Compressor Station, Hinkley, California. 31 January.

TABLE 1

ALTERNATIVES 4, 4A, AND 4B COMPARISON TABLE  
PACIFIC GAS AND ELECTRIC COMPANY  
HINKLEY, CALIFORNIA

Major Item	Alternative 4 (per FS)	Alternative 4A (Addendum #1)	Alternative 4B (Addendum #2)
Agricultural Units	840/950 gpm <sup>Note 1,2</sup>	1270 gpm	1270 gpm
Northwest Freshwater Injection	40 gpm	80 gpm	80 gpm
Far-field Carbon Amended Injection IRZ	195/0 gpm <sup>Note 1,2</sup>	195/195/255/170 gpm <sup>Note 1</sup>	195/195/255/170 gpm <sup>Note 1</sup>
Near-field Recirculation IRZ	275/0 gpm <sup>Note 1,3</sup>	290/140/140/0 gpm <sup>Note 1,3</sup>	290/140/140/0 gpm <sup>Note 1,3</sup>
Central Area	150/0 gpm <sup>Note 1,3</sup>	140/140/140/0 gpm <sup>Note 1,3</sup>	140/140/140/0 gpm <sup>Note 1,3</sup>
Source Area	125/0 gpm <sup>Note 1,3</sup>	150/0/0/0 gpm <sup>Note 1,3</sup>	150/0/0/0 gpm <sup>Note 1,3</sup>
<b>Primary Differences Between Alternatives</b>			
1. Central Area IRZ	Current horizontal length for the recirculation IRZ, with supplemental SCRIA injection points to the east	Increase the width by 100 percent over the current length, expanding to the east and west to intercept a greater portion of the plume	Increase the width by 100 percent over the current length, expanding to the east and west to intercept a greater portion of the plume <b>No change compared to Alternative 4A</b>
2. Operation of IRZ Components (SCRIA, Source Area, and Central Area)	5 years	20 years (intermittent, low concentration carbon amendment continues beyond 20 years - see text for description)	20 years (intermittent, low concentration carbon amendment continues beyond 20 years in SCRIA Injection Area & Source Area) <b>No change compared to Alternative 4A</b>
3. Plume Containment and Treatment via GW Extraction	950 gallons per minute (gpm) average annual withdrawal, 840 gpm of which is sent to AUs, and 110 gpm is sent to the SCRIA (while IRZ is in operation)	Increase the amount of withdrawal above Alternative 4 by 430 gpm (to a total of 1,380 gpm total). The increased withdrawal all goes to support AU expansion. After year 10, an additional 60 gpm is pumped and sent to the SCRIA.	Increase the amount of withdrawal above Alternative 4 by 430 gpm (to a total of 1,380 gpm total). The increased withdrawal all goes to support AU expansion. After year 10, an additional 60 gpm is pumped and sent to the SCRIA. <b>After year 10, 2 of the original extraction wells to support the new AUs are shut down, and the same flow (total of 100 gpm) is extracted from 12 new extraction wells located in the plume toe (10 in the vicinity of the existing SCRIA and DVD AU extraction wells, and 2 in the vicinity of the Gorman AU extraction wells), and redirects this flow to the new AUs.</b>
4. Duration of GW Extraction	Until background concentrations are achieved	Until background concentrations are achieved	Until background concentrations are achieved <b>No change compared to Alternative 4A</b>
<b>Estimated Timeframe of Alternative to Reach:</b> <sup>Note 4</sup>			
50 µg/L	6 years	6 years	6 years
80% mass removal	13 years	10 years	10 years
3.1 µg/L	150 years	75 years	<b>40 years</b>
1.2 µg/L	220 years	130 years	<b>95 years</b>

**Notes:**

- Flows by each major item are separated by optimization using "/"; Alternative 4 has one optimization at 5 years; Alternative 4A and Alternative 4B have optimizations at 5, 10, and 20 years.
- Under Alternative 4, 840 gpm is applied to Agricultural Units in initial buildout, then once IRZs are shut down at year 5, the flow from the SCRIA IRZ extraction is sent to the Agricultural Units for a total of 950 gpm applied to AUs.
- Estimated IRZ recirculation flows (i.e., the water is both extracted and injected) are shown.
- Except for 80% mass reduction timeframe, durations based on fate & transport model performed by ARCADIS and represent time when the starting plume area has been reduced by 99 percent in the Remedial Area. The values in these tables represent the longer of Layers 1 and 3. Durations are capped at 1000 years for purposes of this costing and feasibility evaluation.

**TABLE 2**  
**ESTIMATED TIME AND COSTS TO REACH CHROMIUM REMEDIATION GOALS**  
**PACIFIC GAS AND ELECTRIC COMPANY**  
**HINKLEY, CALIFORNIA**

	<b>MCL Cr(T) 50 ug/L</b>			<b>Estimated Time to 80% Chromium Mass Removal</b>	<b>Maximum Background Cr(VI) 3.1 ug/L</b>			<b>Average Background Cr(VI) 1.2 ug/L</b>		
<b>Alternative</b>	<b>Years*</b>	<b>Non-Discounted Cost*</b>	<b>NPV Cost*</b>	<b>Years*</b>	<b>Years*</b>	<b>Non-Discounted Cost*</b>	<b>NPV Cost*</b>	<b>Years**</b>	<b>Non-Discounted Cost*</b>	<b>NPV Cost*</b>
<b>1: No Further Action</b>	750-1000	\$0M	\$0M	>780	>1000	\$0M	\$0M	>1000	\$0M	\$0M
<b>2: Containment</b>	120	\$123M	\$35.3M	95	260	\$258M	\$36.0M	320	\$316M	\$36.0M
<b>3: Plume-Wide In-Situ Treatment</b>	8	\$58.1M	\$50.7M	10	110	\$399M	\$130M	180	\$634M	\$133M
<b>4: Core In-Situ Treatment and Beneficial Agricultural Use</b>	6	\$28.9M	\$27.2M	13	150	\$154M	\$50.2M	220	\$215M	\$50.4M
<b>5: Plume-Wide Pump and Treat</b>	50	\$334M	\$180M	37	140	\$882M	\$218M	210	\$1.31B	\$221M
<b>4A: Aggressive In- Situ Treatment and Beneficial Agricultural Use</b>	6	\$36.1M	\$34.0M	10	75	\$142M	\$78.7M	130	\$203M	\$81.5M
<b>Combined Alternative</b>	28	\$173M	\$121M	18	90	\$295M	\$151M	130	\$340M	\$153M
<b>4B: Aggressive In- Situ Treatment and Beneficial Agricultural Use with Targeted Pumping</b>	6	\$36.1M	\$34.0M	10	40	\$109M	\$75.9M	95	\$176M	\$84.9M

\*Except for 80% mass reduction timeframe, durations based on fate & transport model performed by ARCADIS and represent time when the starting plume area has been reduced by 99 percent in the Remedial Area. The values in these tables represent the longer of Layers 1 and 3. Durations are capped at 1000 years for purposes of this costing and feasibility evaluation.

\*\*Timeframe to reach 1.2 ug/L shown above, to the extent achieving this criteria is feasible, is based on modeling.

Unless otherwise noted, Non-Discounted and NPV costs in millions and refer to the capital and O&M cost for the duration to reach the criteria.

ug/L - micrograms per liter chromium

NPV = Net present value

\$M = Millions of dollars

\$B = Billions of dollars

OPINION OF PROBABLE COST	Hinkley Feasibility Study Including Addendum #2	Project Number: 36385
Cost Breakdown Detail by Component		Date: 22-Feb-11

ALT	Area	Opt No.	Sheet Name	Capital	Annual O&M	NPV to reach 50 ug/L Hexavalent Chromium*					Non-discounted Cash Flow to reach 50 ug/L Hexavalent Chromium*			
						Optimization		Capital	O&M x No. of years	Total Capital & O&M	Optimization		O&M x No. of years	Total Capital & O&M
						Begin	End				Begin	End		
Alternative 2 - Containment														
Freshwater Injection	Northwest Freshwater Injection	Initial	NW Injection 40 gpm	\$ -	\$ 157,524	0	120	\$ -	\$ 4,851,770	\$ 4,851,770	0	120	\$ 18,902,938	\$ 18,902,938
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (Current)	\$ -	\$ 420,200	0	25	\$ -	\$ 7,180,314	\$ 7,180,314	0	25	\$ 10,505,000	\$ 10,505,000
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (75%)	\$ -	\$ 315,150	25	120	\$ -	\$ 4,321,416	\$ 4,321,416	25	120	\$ 29,939,250	\$ 29,939,250
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (50%)	\$ -	\$ 210,100	0	0	\$ -	\$ -	\$ -	0	0	\$ -	\$ -
Extraction for AU Application	Northern Extraction	Initial	Northern Extraction (2)	\$ 900,600	\$ 84,747	0	120	\$ 900,600	\$ 2,610,217	\$ 3,510,817	0	120	\$ 10,169,642	\$ 11,070,242
Extraction for AU Application	SCRIA Extraction	Initial	SCRIA Extraction	\$ -	\$ 72,722	0	120	\$ -	\$ 2,239,855	\$ 2,239,855	0	120	\$ 8,726,680	\$ 8,726,680
AU Application	Agricultural Units	Initial	AU Mods	\$ 240,000	\$ -	0	120	\$ 240,000	\$ -	\$ 240,000	0	120	\$ -	\$ 240,000
AU Application	Agricultural Units	Initial	New AU	\$ 2,213,475	\$ -	0	120	\$ 2,213,475	\$ -	\$ 2,213,475	0	120	\$ -	\$ 2,213,475
AU Application	Agricultural Units	Initial	AU O&M Summary	\$ -	\$ 339,181	0	120	\$ -	\$ 10,446,815	\$ 10,446,815	0	120	\$ 40,701,742	\$ 40,701,742
Land Acquisition	Land Acquisition or Other	Initial	Alt 2 Land Acq	\$ 320,000	\$ -	0	120	\$ 320,000	\$ -	\$ 320,000	0	120	\$ -	\$ 320,000
TOTAL				\$ 3,674,075				\$ 3,674,075	\$ 31,650,387	\$ 35,324,462			\$ 118,945,252	\$ 122,619,327



OPINION OF PROBABLE COST	Hinkley Feasibility Study Including Addendum #2	Project Number: 36385
Cost Breakdown Detail by Component		Date: 22-Feb-11

ALT	Area	Opt No.	Sheet Name	Capital	Annual O&M	NPV to reach 50 ug/L Hexavalent Chromium*					Non-discounted Cash Flow to reach 50 ug/L Hexavalent Chromium*			
						Optimization		Capital	O&M x No. of years	Total Capital & O&M	Optimization		O&M x No. of years	Total Capital & O&M
						Begin	End				Begin	End		

Alternative 3 - Plume-Wide In-Situ Treatment

Freshwater Injection	Northwest Freshwater Injection	Initial	NW Injection 40 gpm	\$ -	\$ 157,524	0	8	\$ -	\$ 1,097,886	\$ 1,097,886	0	8	\$ 1,260,196	\$ 1,260,196
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (Current)	\$ -	\$ 420,200	0	8	\$ -	\$ 2,928,635	\$ 2,928,635	0	8	\$ 3,361,600	\$ 3,361,600
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (75%)	\$ -	\$ 315,150	0	0	\$ -	\$ -	\$ -	0	0	\$ -	\$ -
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (50%)	\$ -	\$ 210,100	0	0	\$ -	\$ -	\$ -	0	0	\$ -	\$ -
Groundwater Extraction	Northern Extraction	Initial	Northern Extraction (3)	\$ 1,675,800	\$ 86,455	0	8	\$ 1,675,800	\$ 602,557	\$ 2,278,357	0	8	\$ 691,639	\$ 2,367,439
Groundwater Extraction	SCRIA Extraction	Initial	SCRIA Extraction	\$ -	\$ 72,722	0	8	\$ -	\$ 506,847	\$ 506,847	0	8	\$ 581,779	\$ 581,779
Groundwater Extraction	DVD Extraction	Initial	Alt 3_PIPE-WELL (0 - 5)	\$ -	\$ 76,992	0	5	\$ -	\$ 350,895	\$ 350,895	0	5	\$ 384,959	\$ 384,959
Groundwater Extraction	DVD Extraction	Opt 1	Alt 3_PIPE-WELL (5 - 10)	\$ -	\$ 76,992	5	8	\$ -	\$ 185,709	\$ 185,709	5	8	\$ 230,976	\$ 230,976
Groundwater Extraction	DVD Extraction	Opt 2	Alt 3_PIPE-WELL (10+)	\$ -	\$ 76,992	0	0	\$ -	\$ -	\$ -	0	0	\$ -	\$ -
Groundwater Extraction	DVD Extraction	Opt 3	Alt 3_PIPE-WELL (10+)	\$ -	\$ 76,992	0	0	\$ -	\$ -	\$ -	0	0	\$ -	\$ -
Groundwater Extraction	Gorman Extraction	Initial	Alt 3_PIPE-WELL (0 - 5)	\$ -	\$ 60,024	0	5	\$ -	\$ 273,564	\$ 273,564	0	5	\$ 300,121	\$ 300,121
Groundwater Extraction	Gorman Extraction	Opt 1	Alt 3_PIPE-WELL (5 - 10)	\$ -	\$ 60,024	5	8	\$ -	\$ 144,782	\$ 144,782	5	8	\$ 180,073	\$ 180,073
Groundwater Extraction	Gorman Extraction	Opt 2	Alt 3_PIPE-WELL (10+)	\$ -	\$ 60,024	0	0	\$ -	\$ -	\$ -	0	0	\$ -	\$ -
Groundwater Extraction	Gorman Extraction	Opt 3	Alt 3_PIPE-WELL (10+)	\$ -	\$ 60,024	0	0	\$ -	\$ -	\$ -	0	0	\$ -	\$ -
Dosed Injection	Northern Injection	Initial	Alt #3_0 to 5 yrs	\$ -	\$ -	0	5	\$ -	\$ -	\$ -	0	5	\$ -	\$ -
Dosed Injection	Northern Injection	Opt 1	Alt #3_5 to 10 yrs	\$ 4,642,022	\$ 666,354	5	8	\$ 3,971,367	\$ 1,607,287	\$ 5,578,654	5	8	\$ 1,999,062	\$ 6,641,084
Dosed Injection	Northern Injection	Opt 2	Alt #3_10 to 15 yrs	\$ 2,024,500	\$ 742,545	0	0	\$ -	\$ -	\$ -	0	0	\$ -	\$ 2,024,500
Dosed Injection	Northern Injection	Opt 3	Alt #3_15+ yrs	\$ -	\$ 495,898	0	0	\$ -	\$ -	\$ -	0	0	\$ -	\$ -
Dosed Injection	Central Area IRZ / Injection	Initial	Alt #3_0 to 5 yrs	\$ 1,353,685	\$ 918,288	0	5	\$ 1,353,685	\$ 4,185,153	\$ 5,538,838	0	5	\$ 4,591,438	\$ 5,945,123
Dosed Injection	Central Area IRZ / Injection	Opt 1	Alt #3_5 to 10 yrs	\$ -	\$ 918,288	5	8	\$ -	\$ 2,214,965	\$ 2,214,965	5	8	\$ 2,754,863	\$ 2,754,863
Dosed Injection	Central Area IRZ / Injection	Opt 2	Alt #3_10 to 15 yrs	\$ -	\$ -	0	0	\$ -	\$ -	\$ -	0	0	\$ -	\$ -
Dosed Injection	Central Area IRZ / Injection	Opt 3	Alt #3_15+ yrs	\$ -	\$ -	0	0	\$ -	\$ -	\$ -	0	0	\$ -	\$ -
Dosed Injection	SCRIA / Dosed Injection	Initial	Alt #3_0 to 5 yrs	\$ 2,115,069	\$ 643,490	0	5	\$ 2,115,069	\$ 2,932,746	\$ 5,047,815	0	5	\$ 3,217,450	\$ 5,332,519
Dosed Injection	SCRIA / Dosed Injection	Opt 1	Alt #3_5 to 10 yrs	\$ -	\$ 357,888	5	8	\$ -	\$ 863,247	\$ 863,247	5	8	\$ 1,073,664	\$ 1,073,664
Dosed Injection	SCRIA / Dosed Injection	Opt 2	Alt #3_10 to 15 yrs	\$ -	\$ -	0	0	\$ -	\$ -	\$ -	0	0	\$ -	\$ -
Dosed Injection	SCRIA / Dosed Injection	Opt 3	Alt #3_15+ yrs	\$ -	\$ 358,973	0	0	\$ -	\$ -	\$ -	0	0	\$ -	\$ -
Dosed Injection	Source Area IRZ / Injection	Initial	Alt #3_0 to 5 yrs	\$ 3,595,618	\$ 946,596	0	5	\$ 3,595,618	\$ 4,314,169	\$ 7,909,787	0	5	\$ 4,732,978	\$ 8,328,596
Dosed Injection	Source Area IRZ / Injection	Opt 1	Alt #3_5 to 10 yrs	\$ -	\$ -	5	8	\$ -	\$ -	\$ -	5	8	\$ -	\$ -
Dosed Injection	Source Area IRZ / Injection	Opt 2	Alt #3_10 to 15 yrs	\$ -	\$ -	0	0	\$ -	\$ -	\$ -	0	0	\$ -	\$ -
Dosed Injection	Source Area IRZ / Injection	Opt 3	Alt #3_15+ yrs	\$ -	\$ 669,535	0	0	\$ -	\$ -	\$ -	0	0	\$ -	\$ -
Dosed Injection	Northern Plume Fringe	Initial	Alt #3_0 to 5 yrs	\$ -	\$ 112,201	0	5	\$ -	\$ 511,362	\$ 511,362	0	5	\$ 561,004	\$ 561,004
Dosed Injection	Northern Plume Fringe	Opt 1	Alt #3_5 to 10 yrs	\$ -	\$ 112,201	5	8	\$ -	\$ 270,635	\$ 270,635	5	8	\$ 336,603	\$ 336,603
Dosed Injection	Northern Plume Fringe	Opt 2	Alt #3_10 to 15 yrs	\$ -	\$ 112,201	0	0	\$ -	\$ -	\$ -	0	0	\$ -	\$ -
Dosed Injection	Northern Plume Fringe	Opt 3	Alt #3_15+ yrs	\$ -	\$ 112,201	0	0	\$ -	\$ -	\$ -	0	0	\$ -	\$ -
Dosed Injection	Southeast and East Plume Fringe	Initial	Alt #3_0 to 5 yrs	\$ -	\$ 168,301	0	5	\$ -	\$ 767,043	\$ 767,043	0	5	\$ 841,506	\$ 841,506
Dosed Injection	Southeast and East Plume Fringe	Opt 1	Alt #3_5 to 10 yrs	\$ -	\$ 209,102	5	8	\$ -	\$ 504,366	\$ 504,366	5	8	\$ 627,305	\$ 627,305
Dosed Injection	Southeast and East Plume Fringe	Opt 2	Alt #3_10 to 15 yrs	\$ -	\$ 173,401	0	0	\$ -	\$ -	\$ -	0	0	\$ -	\$ -
Dosed Injection	Southeast and East Plume Fringe	Opt 3	Alt #3_15+ yrs	\$ -	\$ 173,401	0	0	\$ -	\$ -	\$ -	0	0	\$ -	\$ -
Dosed Injection	Southern Plume Fringe	Initial	Alt #3_0 to 5 yrs	\$ -	\$ 158,101	0	5	\$ -	\$ 720,556	\$ 720,556	0	5	\$ 790,506	\$ 790,506
Dosed Injection	Southern Plume Fringe	Opt 1	Alt #3_5 to 10 yrs	\$ -	\$ 249,902	5	8	\$ -	\$ 602,778	\$ 602,778	5	8	\$ 749,706	\$ 749,706
Dosed Injection	Southern Plume Fringe	Opt 2	Alt #3_10 to 15 yrs	\$ -	\$ 249,902	0	0	\$ -	\$ -	\$ -	0	0	\$ -	\$ -
Dosed Injection	Southern Plume Fringe	Opt 3	Alt #3_15+ yrs	\$ -	\$ 249,902	0	0	\$ -	\$ -	\$ -	0	0	\$ -	\$ -

OPINION OF PROBABLE COST	Hinkley Feasibility Study Including Addendum #2	Project Number: 36385
Cost Breakdown Detail by Component		Date: 22-Feb-11

ALT	Area	Opt No.	Sheet Name	Capital	Annual O&M	NPV to reach 50 ug/L Hexavalent Chromium*					Non-discounted Cash Flow to reach 50 ug/L Hexavalent Chromium*			
						Optimization		Capital	O&M x No. of years	Total Capital & O&M	Optimization		O&M x No. of years	Total Capital & O&M
						Begin	End				Begin	End		
Dosed Injection	Northern Plume Fringe	Initial	Alt 3_PIPE-WELL (0 - 5)	\$ 1,745,667	\$ 146,300	0	5	\$ 1,745,667	\$ 666,771	\$ 2,412,438	0	5	\$ 731,500	\$ 2,477,167
Dosed Injection	Northern Plume Fringe	Opt 1	Alt 3_PIPE-WELL (5 - 10)	\$ -	\$ 146,300	5	8	\$ -	\$ 352,884	\$ 352,884	5	8	\$ 438,900	\$ 438,900
Dosed Injection	Northern Plume Fringe	Opt 2	Alt 3_PIPE-WELL (10+)	\$ -	\$ 146,300	0	0	\$ -	\$ -	\$ -	0	0	\$ -	\$ -
Dosed Injection	Northern Plume Fringe	Opt 3	Alt 3_PIPE-WELL (10+)	\$ -	\$ 146,300	0	0	\$ -	\$ -	\$ -	0	0	\$ -	\$ -
Dosed Injection	Southeast and East Plume Fringe	Initial	Alt 3_PIPE-WELL (0 - 5)	\$ 2,094,800	\$ 184,360	0	5	\$ 2,094,800	\$ 840,232	\$ 2,935,032	0	5	\$ 921,800	\$ 3,016,600
Dosed Injection	Southeast and East Plume Fringe	Opt 1	Alt 3_PIPE-WELL (5 - 10)	\$ 1,401,273	\$ 265,540	5	8	\$ 1,198,824	\$ 640,499	\$ 1,839,323	5	8	\$ 796,620	\$ 2,197,893
Dosed Injection	Southeast and East Plume Fringe	Opt 2	Alt 3_PIPE-WELL (10+)	\$ -	\$ 184,360	0	0	\$ -	\$ -	\$ -	0	0	\$ -	\$ -
Dosed Injection	Southeast and East Plume Fringe	Opt 3	Alt #3_15+ yrs	\$ -	\$ 173,401	0	0	\$ -	\$ -	\$ -	0	0	\$ -	\$ -
Dosed Injection	Southern Plume Fringe	Initial	Alt 3_PIPE-WELL (0 - 5)	\$ 2,443,933	\$ 211,420	0	5	\$ 2,443,933	\$ 963,560	\$ 3,407,493	0	5	\$ 1,057,100	\$ 3,501,033
Dosed Injection	Southern Plume Fringe	Opt 1	Alt 3_PIPE-WELL (5 - 10)	\$ 800,727	\$ 319,660	5	8	\$ 685,042	\$ 771,039	\$ 1,456,082	5	8	\$ 958,980	\$ 1,759,707
Dosed Injection	Southern Plume Fringe	Opt 2	Alt 3_PIPE-WELL (10+)	\$ -	\$ 319,660	0	0	\$ -	\$ -	\$ -	0	0	\$ -	\$ -
Dosed Injection	Southern Plume Fringe	Opt 3	Alt 3_PIPE-WELL (10+)	\$ -	\$ 319,660	0	0	\$ -	\$ -	\$ -	0	0	\$ -	\$ -
Land Acquisition	Land Acquisition or Other	Initial	Alt 3 Land Acq	\$ 20,000	\$ -	0	8	\$ 20,000	\$ -	\$ 20,000	0	8	\$ -	\$ 20,000
TOTAL				\$ 23,913,094		\$ 20,899,805 \$ 29,820,170 \$ 50,719,975					\$ 34,172,326 \$ 58,085,420			

Alternative 4 - Core In-Site Treatment and Beneficial Agricultural Use														
Freshwater Injection	Northwest Freshwater Injection	Initial	NW Injection 40 gpm	\$ -	\$ 157,524	0	6	\$ -	\$ 848,553	\$ 848,553	0	6	\$ 945,147	\$ 945,147
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (Current)	\$ -	\$ 420,200	0	6	\$ -	\$ 2,263,534	\$ 2,263,534	0	6	\$ 2,521,200	\$ 2,521,200
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (75%)	\$ -	\$ 315,150	0	0	\$ -	\$ -	\$ -	0	0	\$ -	\$ -
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (50%)	\$ -	\$ 210,100	0	0	\$ -	\$ -	\$ -	0	0	\$ -	\$ -
Extraction for AU Application	Northern Extraction	Initial	Northern Extraction (4)	\$ 1,103,400	\$ 84,747	0	6	\$ 1,103,400	\$ 456,515	\$ 1,559,915	0	6	\$ 508,482	\$ 1,611,882
Groundwater Extraction	SCRIA Extraction	Initial	SCRIA Extraction	\$ -	\$ 72,722	0	6	\$ -	\$ 391,741	\$ 391,741	0	6	\$ 436,334	\$ 436,334
Groundwater Extraction	SCRIA Extraction	Initial	Supplemental SCRIA Extraction	\$ -	\$ 54,559	0	6	\$ -	\$ 293,900	\$ 293,900	0	6	\$ 327,356	\$ 327,356
IRZ/Dosed Injection	Central Area IRZ / Injection	Initial	Alt #4_0 to 5 yrs	\$ 1,337,296	\$ 918,288	0	5	\$ 1,337,296	\$ 4,185,153	\$ 5,522,449	0	5	\$ 4,591,438	\$ 5,928,734
IRZ/Dosed Injection	SCRIA / Dosed Injection	Initial	Alt #4_0 to 5 yrs	\$ 4,698,720	\$ 476,809	0	5	\$ 4,698,720	\$ 2,173,086	\$ 6,871,806	0	5	\$ 2,384,044	\$ 7,082,764
IRZ/Dosed Injection	Source Area IRZ / Injection	Initial	Alt #4_0 to 5 yrs	\$ 1,249,906	\$ 814,241	0	5	\$ 1,249,906	\$ 3,710,952	\$ 4,960,858	0	5	\$ 4,071,203	\$ 5,321,109
AU Application	Agricultural Units	Initial	AU Mods	\$ 240,000	\$ -	0	5	\$ 240,000	\$ -	\$ 240,000	0	5	\$ -	\$ 240,000
AU Application	Agricultural Units	Initial	New AU	\$ 2,213,475	\$ -	0	5	\$ 2,213,475	\$ -	\$ 2,213,475	0	5	\$ -	\$ 2,213,475
AU Application	Agricultural Units	Initial	AU O&M Summary	\$ -	\$ 319,636	0	5	\$ -	\$ 1,456,759	\$ 1,456,759	0	5	\$ 1,598,178	\$ 1,598,178
AU Application	Agricultural Units	Opt 1	AU O&M Summary	\$ -	\$ 339,181	5	6	\$ -	\$ 281,262	\$ 281,262	5	6	\$ 339,181	\$ 339,181
Land Acquisition	Land Acquisition or Other	Initial	Alt 4 Land Acq	\$ 337,600	\$ -	0	6	\$ 337,600	\$ -	\$ 337,600	0	6	\$ -	\$ 337,600
TOTAL				\$ 11,180,397		\$ 16,061,455 \$ 27,241,852					\$ 17,722,563 \$ 28,902,960			

OPINION OF PROBABLE COST	Hinkley Feasibility Study Including Addendum #2	Project Number: 36385
Cost Breakdown Detail by Component		Date: 22-Feb-11

ALT	Area	Opt No.	Sheet Name	Capital	Annual O&M	NPV to reach 50 ug/L Hexavalent Chromium*					Non-discounted Cash Flow to reach 50 ug/L Hexavalent Chromium*			
						Optimization		Capital	O&M x No. of years	Total Capital & O&M	Optimization		O&M x No. of years	Total Capital & O&M
						Begin	End				Begin	End		

Alternative 4A - Aggressive Core In-Site Treatment and Beneficial Agricultural Use																					
Freshwater Injection	Northwest Freshwater Injection	Initial	NW Injection 80 gpm	\$	-	\$	149,257	0	6	\$	-	\$	804,018	\$	804,018	0	6	\$	895,542	\$	895,542
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (Current)	\$	-	\$	420,200	0	6	\$	-	\$	2,263,534	\$	2,263,534	0	6	\$	2,521,200	\$	2,521,200
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (75%)	\$	-	\$	315,150	0	0	\$	-	\$	-	\$	-	0	0	\$	-	\$	-
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (50%)	\$	-	\$	210,100	0	0	\$	-	\$	-	\$	-	0	0	\$	-	\$	-
Extraction for AU Application	Northern Extraction	Initial	Northern Extraction (4A)	\$	2,623,560	\$	-	0	6	\$	2,623,560	\$	-	\$	2,623,560	0	6	\$	-	\$	2,623,560
Groundwater Extraction	SCRIA Extraction	Initial	SCRIA Extraction (5 wells)	\$	-	\$	86,274	0	6	\$	-	\$	464,743	\$	464,743	0	6	\$	517,646	\$	517,646
Groundwater Extraction	SCRIA Extraction	Initial	Supplemental SCRIA Extraction	\$	-	\$	54,559	0	6	\$	-	\$	293,900	\$	293,900	0	6	\$	327,356	\$	327,356
Groundwater Extraction	SCRIA Extraction	Opt 2	DVD SCRIA Extr (60 gpm)	\$	742,200	\$	55,755	0	0	\$	-	\$	-	\$	-	0	0	\$	-	\$	-
Groundwater Extraction	SCRIA Extraction	Opt 3	SCRIA Extraction for low dose	\$	-	\$	142,029	0	0	\$	-	\$	-	\$	-	0	0	\$	-	\$	-
IRZ/Dosed Injection	Central Area IRZ / Injection	Initial	Alt #4A_0 to 5 yrs	\$	2,077,153	\$	904,760	0	5	\$	2,077,153	\$	4,123,498	\$	6,200,651	0	5	\$	4,523,798	\$	6,600,951
IRZ/Dosed Injection	SCRIA / Dosed Injection	Initial	Alt #4A_0 to 5 yrs	\$	2,927,479	\$	478,213	0	5	\$	2,927,479	\$	2,179,485	\$	5,106,964	0	5	\$	2,391,064	\$	5,318,543
IRZ/Dosed Injection	Source Area IRZ / Injection	Initial	Alt #4A_0 to 5 yrs	\$	3,083,759	\$	821,971	0	5	\$	3,083,759	\$	3,746,184	\$	6,829,944	0	5	\$	4,109,855	\$	7,193,615
IRZ/Dosed Injection	Central Area IRZ / Injection	Opt 1	Alt #4A_5 to 10 yrs	\$	-	\$	904,760	5	6	\$	-	\$	750,261	\$	750,261	5	6	\$	904,760	\$	904,760
IRZ/Dosed Injection	SCRIA / Dosed Injection	Opt 1	Alt #4A_5 to 10 yrs	\$	356,104	\$	380,628	5	6	\$	304,656	\$	315,631	\$	620,287	5	6	\$	380,628	\$	736,732
IRZ/Dosed Injection	Source Area IRZ / Injection	Opt 1	Alt #4A_5 to 10 yrs	\$	69,296	\$	716,571	5	6	\$	59,284	\$	594,208	\$	653,493	5	6	\$	716,571	\$	785,867
IRZ/Dosed Injection	Central Area IRZ / Injection	Opt 2	Alt #4A_10 to 20 yrs	\$	-	\$	904,760	0	0	\$	-	\$	-	\$	-	0	0	\$	-	\$	-
IRZ/Dosed Injection	SCRIA / Dosed Injection	Opt 2	Alt #4A_10 to 20 yrs	\$	848,241	\$	416,508	0	0	\$	-	\$	-	\$	-	0	0	\$	-	\$	-
IRZ/Dosed Injection	Source Area IRZ / Injection	Opt 2	Alt #4A_10 to 20 yrs	\$	327,581	\$	294,136	0	0	\$	-	\$	-	\$	-	0	0	\$	-	\$	-
IRZ/Dosed Injection	Central Area IRZ / Injection	Opt 3	Alt #4A_20+ yrs	\$	-	\$	-	0	0	\$	-	\$	-	\$	-	0	0	\$	-	\$	-
IRZ/Dosed Injection	SCRIA / Dosed Injection	Opt 3	Alt #4A_20+ yrs	\$	-	\$	88,342	0	0	\$	-	\$	-	\$	-	0	0	\$	-	\$	-
IRZ/Dosed Injection	Source Area IRZ / Injection	Opt 3	Alt #4A_20+ yrs	\$	-	\$	38,842	0	0	\$	-	\$	-	\$	-	0	0	\$	-	\$	-
AU Application	Agricultural Units	Initial	AU Mods	\$	240,000	\$	-	0	6	\$	240,000	\$	-	\$	240,000	0	6	\$	-	\$	240,000
AU Application	Agricultural Units	Initial	New AU (Rev)	\$	3,469,796	\$	-	0	6	\$	3,469,796	\$	-	\$	3,469,796	0	6	\$	-	\$	3,469,796
AU Application	Agricultural Units	Initial	AU O&M Summary	\$	-	\$	491,904	0	6	\$	-	\$	2,649,789	\$	2,649,789	0	6	\$	2,951,425	\$	2,951,425
Land Acquisition	Land Acquisition or Other	Initial	Alt 4a Land Acq	\$	1,012,600	\$	-	0	6	\$	1,012,600	\$	-	\$	1,012,600	0	6	\$	-	\$	1,012,600
TOTAL				\$	17,777,770			\$ 15,798,289			\$ 18,185,251	\$ 33,983,539	\$ 20,239,844			\$ 36,099,592					

OPINION OF PROBABLE COST	Hinkley Feasibility Study Including Addendum #2	Project Number: 36385
Cost Breakdown Detail by Component		Date: 22-Feb-11

ALT	Area	Opt No.	Sheet Name	Capital	Annual O&M	NPV to reach 50 ug/L Hexavalent Chromium*					Non-discounted Cash Flow to reach 50 ug/L Hexavalent Chromium*			
						Optimization		Capital	O&M x No. of years	Total Capital & O&M	Optimization		O&M x No. of years	Total Capital & O&M
						Begin	End				Begin	End		

Alternative 4B - Aggressive Core In-Site Treatment and Beneficial Agricultural Use with Targeted Pumping																						
Freshwater Injection	Northwest Freshwater Injection	Initial	NW Injection 80 gpm	\$	-	\$	149,257	0	6	\$	-	\$	804,018	\$	804,018	0	6	\$	895,542	\$	895,542	
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (Current)	\$	-	\$	420,200	0	6	\$	-	\$	2,263,534	\$	2,263,534	0	6	\$	2,521,200	\$	2,521,200	
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (75%)	\$	-	\$	315,150	0	0	\$	-	\$	-	\$	-	0	0	\$	-	\$	-	
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (50%)	\$	-	\$	210,100	0	0	\$	-	\$	-	\$	-	0	0	\$	-	\$	-	
Extraction for AU Application	Northern Extraction	Initial	Northern Extraction (4A)	\$	2,623,560	\$	-	0	6	\$	2,623,560	\$	-	\$	2,623,560	0	6	\$	-	\$	2,623,560	
Extraction for AU Application	Northern Extraction	Initial	Northern Extraction (4B at 10)	\$	3,390,900	\$	100,562	0	0	\$	-	\$	-	\$	-	0	0	\$	-	\$	-	
Groundwater Extraction	SCRIA Extraction	Initial	SCRIA Extraction (5 wells)	\$	-	\$	86,274	0	6	\$	-	\$	464,743	\$	464,743	0	6	\$	517,646	\$	517,646	
Groundwater Extraction	SCRIA Extraction	Initial	Supplemental SCRIA Extraction	\$	-	\$	54,559	0	6	\$	-	\$	293,900	\$	293,900	0	6	\$	327,356	\$	327,356	
Groundwater Extraction	SCRIA Extraction	Opt 2	DVD_SCRIA Extr (60 gpm)	\$	742,200	\$	55,755	0	0	\$	-	\$	-	\$	-	0	0	\$	-	\$	-	
Groundwater Extraction	SCRIA Extraction	Opt 3	SCRIA Extraction for low dose	\$	-	\$	142,029	0	0	\$	-	\$	-	\$	-	0	0	\$	-	\$	-	
IRZ/Dosed Injection	Central Area IRZ / Injection	Initial	Alt #4A_0 to 5 yrs	\$	2,077,153	\$	904,760	0	5	\$	2,077,153	\$	4,123,498	\$	6,200,651	0	5	\$	4,523,798	\$	6,600,951	
IRZ/Dosed Injection	SCRIA / Dosed Injection	Initial	Alt #4A_0 to 5 yrs	\$	2,927,479	\$	478,213	0	5	\$	2,927,479	\$	2,179,485	\$	5,106,964	0	5	\$	2,391,064	\$	5,318,543	
IRZ/Dosed Injection	Source Area IRZ / Injection	Initial	Alt #4A_0 to 5 yrs	\$	3,083,759	\$	821,971	0	5	\$	3,083,759	\$	3,746,184	\$	6,829,944	0	5	\$	4,109,855	\$	7,193,615	
IRZ/Dosed Injection	Central Area IRZ / Injection	Opt 1	Alt #4A_5 to 10 yrs	\$	-	\$	904,760	5	6	\$	-	\$	750,261	\$	750,261	5	6	\$	904,760	\$	904,760	
IRZ/Dosed Injection	SCRIA / Dosed Injection	Opt 1	Alt #4A_5 to 10 yrs	\$	356,104	\$	380,628	5	6	\$	304,656	\$	315,631	\$	620,287	5	6	\$	380,628	\$	736,732	
IRZ/Dosed Injection	Source Area IRZ / Injection	Opt 1	Alt #4A_5 to 10 yrs	\$	69,296	\$	716,571	5	6	\$	59,284	\$	594,208	\$	653,493	5	6	\$	716,571	\$	785,867	
IRZ/Dosed Injection	Central Area IRZ / Injection	Opt 2	Alt #4A_10 to 20 yrs	\$	-	\$	904,760	0	0	\$	-	\$	-	\$	-	0	0	\$	-	\$	-	
IRZ/Dosed Injection	SCRIA / Dosed Injection	Opt 2	Alt #4A_10 to 20 yrs	\$	848,241	\$	416,508	0	0	\$	-	\$	-	\$	-	0	0	\$	-	\$	-	
IRZ/Dosed Injection	Source Area IRZ / Injection	Opt 2	Alt #4A_10 to 20 yrs	\$	327,581	\$	294,136	0	0	\$	-	\$	-	\$	-	0	0	\$	-	\$	-	
IRZ/Dosed Injection	Central Area IRZ / Injection	Opt 3	Alt #4A_20+ yrs	\$	-	\$	-	0	0	\$	-	\$	-	\$	-	0	0	\$	-	\$	-	
IRZ/Dosed Injection	SCRIA / Dosed Injection	Opt 3	Alt #4A_20+ yrs	\$	-	\$	88,342	0	0	\$	-	\$	-	\$	-	0	0	\$	-	\$	-	
IRZ/Dosed Injection	Source Area IRZ / Injection	Opt 3	Alt #4A_20+ yrs	\$	-	\$	38,842	0	0	\$	-	\$	-	\$	-	0	0	\$	-	\$	-	
AU Application	Agricultural Units	Initial	AU Mods	\$	240,000	\$	-	0	6	\$	240,000	\$	-	\$	240,000	0	6	\$	-	\$	240,000	
AU Application	Agricultural Units	Initial	New AU (Rev)	\$	3,469,796	\$	-	0	6	\$	3,469,796	\$	-	\$	3,469,796	0	6	\$	-	\$	3,469,796	
AU Application	Agricultural Units	Initial	AU O&M Summary	\$	-	\$	491,904	0	6	\$	-	\$	2,649,789	\$	2,649,789	0	6	\$	2,951,425	\$	2,951,425	
Land Acquisition	Land Acquisition or Other	Initial	Alt 4a Land Acq	\$	1,012,600	\$	-	0	6	\$	1,012,600	\$	-	\$	1,012,600	0	6	\$	-	\$	1,012,600	
TOTAL				\$	21,168,670					\$	15,798,289	\$	18,185,251	\$	33,983,539				\$	20,239,844	\$	36,099,592



OPINION OF PROBABLE COST	Hinkley Feasibility Study Including Addendum #2	Project Number: 36385
Cost Breakdown Detail by Component		Date: 22-Feb-11

ALT	Area	Opt No.	Sheet Name	Capital	Annual O&M	NPV to reach 50 ug/L Hexavalent Chromium*					Non-discounted Cash Flow to reach 50 ug/L Hexavalent Chromium*				
						Optimization		Capital	O&M x No. of years	Total Capital & O&M	Optimization		O&M x No. of years	Total Capital & O&M	
						Begin	End				Begin	End			

Alternative 5 - Plume-Wide Pump and Treat

Freshwater Injection	Northwest Freshwater Injection	Initial	NW Injection 40 gpm	\$ -	\$ 157,524	0	50	\$ -	\$ 3,925,427	\$ 3,925,427	0	50	\$ 7,876,224	\$ 7,876,224
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (Current)	\$ -	\$ 420,200	0	10	\$ -	\$ 3,553,493	\$ 3,553,493	0	10	\$ 4,202,000	\$ 4,202,000
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (75%)	\$ -	\$ 315,150	0	0	\$ -	\$ -	\$ -	0	0	\$ -	\$ -
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (50%)	\$ -	\$ 210,100	10	50	\$ -	\$ 3,458,834	\$ 3,458,834	10	50	\$ 8,404,000	\$ 8,404,000
Groundwater Extraction	Northern Extraction	Initial	Northern Extraction (5)	\$ 1,675,800	\$ 84,747	0	50	\$ 1,675,800	\$ 2,111,851	\$ 3,787,651	0	50	\$ 4,237,351	\$ 5,913,151
Groundwater Extraction	SCRIA Extraction	Initial	SCRIA Extraction	\$ -	\$ 72,722	0	50	\$ -	\$ 1,812,202	\$ 1,812,202	0	50	\$ 3,636,117	\$ 3,636,117
Groundwater Extraction	DVD Extraction	Initial	Alt 5_PIPE-WELL (0 - 10)	\$ -	\$ 73,576	0	10	\$ -	\$ 622,210	\$ 622,210	0	10	\$ 735,762	\$ 735,762
Groundwater Extraction	DVD Extraction	Opt 1	Alt 5_PIPE-WELL (10 - 15)	\$ -	\$ 73,576	10	15	\$ -	\$ 245,435	\$ 245,435	10	15	\$ 367,881	\$ 367,881
Groundwater Extraction	DVD Extraction	Opt 2	Alt 5_PIPE-WELL (15+)	\$ -	\$ 73,576	15	50	\$ -	\$ 965,836	\$ 965,836	15	50	\$ 2,575,168	\$ 2,575,168
Groundwater Extraction	Gorman Extraction	Initial	Alt 5_PIPE-WELL (0 - 10)	\$ -	\$ 58,316	0	10	\$ -	\$ 493,163	\$ 493,163	0	10	\$ 583,164	\$ 583,164
Groundwater Extraction	Gorman Extraction	Opt 1	Alt 5_PIPE-WELL (10 - 15)	\$ -	\$ 58,316	10	15	\$ -	\$ 194,531	\$ 194,531	10	15	\$ 291,582	\$ 291,582
Groundwater Extraction	Gorman Extraction	Opt 2	Alt 5_PIPE-WELL (15+)	\$ -	\$ 58,316	15	50	\$ -	\$ 765,520	\$ 765,520	15	50	\$ 2,041,075	\$ 2,041,075
Groundwater Extraction	Ranch or Other Extraction	Initial	Alt 5_PIPE-WELL (0 - 10)	\$ 3,202,844	\$ 126,247	0	10	\$ 3,202,844	\$ 1,067,631	\$ 4,270,475	0	10	\$ 1,262,472	\$ 4,465,316
Groundwater Extraction	Ranch or Other Extraction	Opt 1	Alt 5_PIPE-WELL (10 - 15)	\$ 677,400	\$ 126,247	10	15	\$ 495,805	\$ 421,134	\$ 916,939	10	15	\$ 631,236	\$ 1,308,636
Groundwater Extraction	Ranch or Other Extraction	Opt 2	Alt 5_PIPE-WELL (15+)	\$ 885,600	\$ 126,247	15	50	\$ 554,544	\$ 1,657,249	\$ 2,211,793	15	50	\$ 4,418,652	\$ 5,304,252
Treated Injection	Northern Plume Fringe	Initial	Alt 5_PIPE-WELL (0 - 10)	\$ 1,526,995	\$ 146,300	0	10	\$ 1,526,995	\$ 1,237,211	\$ 2,764,206	0	10	\$ 1,463,000	\$ 2,989,995
Treated Injection	Northern Plume Fringe	Opt 1	Alt 5_PIPE-WELL (10 - 15)	\$ -	\$ 146,300	10	15	\$ -	\$ 488,026	\$ 488,026	10	15	\$ 731,500	\$ 731,500
Treated Injection	Northern Plume Fringe	Opt 2	Alt 5_PIPE-WELL (15+)	\$ -	\$ 146,300	15	50	\$ -	\$ 1,920,482	\$ 1,920,482	15	50	\$ 5,120,500	\$ 5,120,500
Treated Injection	Southeast and East Plume Fringe	Initial	Alt 5_PIPE-WELL (0 - 10)	\$ 6,718,776	\$ 617,320	0	10	\$ 6,718,776	\$ 5,220,473	\$ 11,939,249	0	10	\$ 6,173,200	\$ 12,891,976
Treated Injection	Southeast and East Plume Fringe	Opt 1	Alt 5_PIPE-WELL (10 - 15)	\$ -	\$ 617,320	10	15	\$ -	\$ 2,059,248	\$ 2,059,248	10	15	\$ 3,086,600	\$ 3,086,600
Treated Injection	Southeast and East Plume Fringe	Opt 2	Alt 5_PIPE-WELL (15+)	\$ -	\$ 617,320	15	50	\$ -	\$ 8,103,567	\$ 8,103,567	15	50	\$ 21,606,200	\$ 21,606,200
Treated Injection	Southern Plume Fringe	Initial	Alt 5_PIPE-WELL (0 - 10)	\$ 3,359,388	\$ 319,660	0	10	\$ 3,359,388	\$ 2,703,260	\$ 6,062,648	0	10	\$ 3,196,600	\$ 6,555,988
Treated Injection	Southern Plume Fringe	Opt 1	Alt 5_PIPE-WELL (10 - 15)	\$ -	\$ 319,660	10	15	\$ -	\$ 1,066,318	\$ 1,066,318	10	15	\$ 1,598,300	\$ 1,598,300
Treated Injection	Southern Plume Fringe	Opt 2	Alt 5_PIPE-WELL (15+)	\$ -	\$ 319,660	15	50	\$ -	\$ 4,196,180	\$ 4,196,180	15	50	\$ 11,188,100	\$ 11,188,100
Treated Injection	Southwest Plume Fringe	Initial	Alt 5_PIPE-WELL (0 - 10)	\$ 916,197	\$ 92,180	0	10	\$ 916,197	\$ 779,536	\$ 1,695,733	0	10	\$ 921,800	\$ 1,837,997
Treated Injection	Southwest Plume Fringe	Opt 1	Alt 5_PIPE-WELL (10 - 15)	\$ -	\$ 92,180	10	15	\$ -	\$ 307,493	\$ 307,493	10	15	\$ 460,900	\$ 460,900
Treated Injection	Southwest Plume Fringe	Opt 2	Alt 5_PIPE-WELL (15+)	\$ -	\$ 92,180	15	50	\$ -	\$ 1,210,048	\$ 1,210,048	15	50	\$ 3,226,300	\$ 3,226,300
Groundwater Treatment	Ex-Situ Treatment (Chem Precip)	Initial	EX-A	\$ 8,012,515	\$ 4,130,732	0	50	\$ 8,012,515	\$ 102,935,665	\$ 110,948,180	0	50	\$ 206,536,624	\$ 214,549,139
Land Acquisition	Land Acquisition or Other	Initial	Alt 5 Land Acq	\$ 454,000	\$ -	0	50	\$ 454,000	\$ -	\$ 454,000	0	50	\$ -	\$ 454,000
TOTAL				\$ 27,429,515		\$ 26,916,864 \$ 153,522,020 \$ 180,438,885					\$ 306,572,310 \$ 334,001,825			

OPINION OF PROBABLE COST	Hinkley Feasibility Study Including Addendum #2	Project Number: 36385
Cost Breakdown Detail by Component		Date: 22-Feb-11

ALT	Area	Opt No.	Sheet Name	Capital	Annual O&M	NPV to reach 50 ug/L Hexavalent Chromium*					Non-discounted Cash Flow to reach 50 ug/L Hexavalent Chromium*			
						Optimization		Capital	O&M x No. of years	Total Capital & O&M	Optimization		O&M x No. of years	Total Capital & O&M
						Begin	End				Begin	End		

Combined Alternative														
Freshwater Injection	Northwest Freshwater Injection	Initial	NW Injection 80 gpm	\$ -	\$ 149,257	0	28	\$ -	\$ 2,743,346	\$ 2,743,346	0	28	\$ 4,179,195	\$ 4,179,195
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (Current)	\$ -	\$ 420,200	0	15	\$ -	\$ 4,955,191	\$ 4,955,191	0	15	\$ 6,303,000	\$ 6,303,000
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (75%)	\$ -	\$ 315,150	15	28	\$ -	\$ 2,076,070	\$ 2,076,070	15	28	\$ 4,096,950	\$ 4,096,950
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (50%)	\$ -	\$ 210,100	0	0	\$ -	\$ -	\$ -	0	0	\$ -	\$ -
Extraction for AU Application	Northern Extraction	Initial	Northern Extraction (Combined)	\$ 2,623,560	\$ -	0	28	\$ 2,623,560	\$ -	\$ 2,623,560	0	28	\$ -	\$ 2,623,560
Groundwater Extraction	SCRIA Extraction	Initial	SCRIA Extraction (5 wells)	\$ -	\$ 86,274	0	28	\$ -	\$ 1,585,724	\$ 1,585,724	0	28	\$ 2,415,681	\$ 2,415,681
Groundwater Extraction	SCRIA Extraction	Initial	Supplemental SCRIA Extraction	\$ -	\$ 54,559	0	28	\$ -	\$ 1,002,800	\$ 1,002,800	0	28	\$ 1,527,659	\$ 1,527,659
Groundwater Extraction	SCRIA Extraction	Initial	DVD_SCRIA Extr (60 gpm)	\$ 742,200	\$ 55,755	10	28	\$ 543,234	\$ 553,274	\$ 1,096,507	10	28	\$ 1,003,585	\$ 1,745,785
Groundwater Extraction	SCRIA Extraction	Initial	SCRIA Extraction for low dose	\$ -	\$ 142,029	0	0	\$ -	\$ -	\$ -	0	0	\$ -	\$ -
IRZ/Dosed Injection	Central Area IRZ / Injection	Initial	Alt #6_0 to 10 yrs	\$ 2,394,426	\$ 904,760	0	10	\$ 2,394,426	\$ 7,651,254	\$ 10,045,681	0	10	\$ 9,047,595	\$ 11,442,022
IRZ/Dosed Injection	SCRIA / Dosed Injection	Initial	Alt #6_0 to 10 yrs	\$ 3,374,635	\$ 478,213	0	10	\$ 3,374,635	\$ 4,044,089	\$ 7,418,724	0	10	\$ 4,782,128	\$ 8,156,763
IRZ/Dosed Injection	Central Area IRZ / Injection	Opt 1	Alt #6_10 to 40 yrs	\$ -	\$ 904,760	10	28	\$ -	\$ 8,978,243	\$ 8,978,243	10	28	\$ 16,285,671	\$ 16,285,671
IRZ/Dosed Injection	SCRIA / Dosed Injection	Opt 1	Alt #6_10 to 40 yrs	\$ 937,022	\$ 539,845	10	28	\$ 685,828	\$ 5,357,072	\$ 6,042,900	10	28	\$ 9,717,215	\$ 10,654,236
IRZ/Dosed Injection	Central Area IRZ / Injection	Opt 2	Alt #6_40 to 42 yrs	\$ -	\$ -	0	0	\$ -	\$ -	\$ -	0	0	\$ -	\$ -
IRZ/Dosed Injection	SCRIA / Dosed Injection	Opt 2	Alt #6_40 to 42 yrs	\$ 377,067	\$ 365,220	0	0	\$ -	\$ -	\$ -	0	0	\$ -	\$ -
IRZ/Dosed Injection	Source Area IRZ / Injection	Opt 2	Alt #6_40 to 42 yrs	\$ 107,733	\$ 652,153	0	0	\$ -	\$ -	\$ -	0	0	\$ -	\$ -
IRZ/Dosed Injection	SCRIA / Dosed Injection	Opt 3	Alt #6_42+ yrs	\$ -	\$ 88,342	0	0	\$ -	\$ -	\$ -	0	0	\$ -	\$ -
IRZ/Dosed Injection	Source Area IRZ / Injection	Opt 3	Alt #6_42+ yrs	\$ -	\$ 38,842	0	0	\$ -	\$ -	\$ -	0	0	\$ -	\$ -
AU Application	Agricultural Units	Initial	AU Mods	\$ 240,000	\$ -	0	28	\$ 240,000	\$ -	\$ 240,000	0	28	\$ -	\$ 240,000
AU Application	Agricultural Units	Initial	New AU (Rev)	\$ 3,469,796	\$ -	0	28	\$ 3,469,796	\$ -	\$ 3,469,796	0	28	\$ -	\$ 3,469,796
AU Application	Agricultural Units	Initial	AU O&M Summary	\$ -	\$ 491,904	0	28	\$ -	\$ 9,041,207	\$ 9,041,207	0	28	\$ 13,773,315	\$ 13,773,315
Land Acquisition	Land Acquisition or Other	Initial	Alt 6 Land Acq	\$ 1,130,400	\$ -	0	28	\$ 1,130,400	\$ -	\$ 1,130,400	0	28	\$ -	\$ 1,130,400
Groundwater Treatment	Ex-Situ Treatment (Chem Precip)	Initial	EX-A (200 gpm)	\$ 3,494,573	\$ 2,123,267	0	28	\$ 3,494,573	\$ 39,025,693	\$ 42,520,266	0	28	\$ 59,451,483	\$ 62,946,056
Groundwater Extraction & O&M for plant and treated injection	Ex-Situ Treatment (Chem Precip)	Initial	Alt 6_PIPE-WELL (0-10)	\$ 4,221,720	\$ 624,855	0	10	\$ 4,221,720	\$ 5,284,195	\$ 9,505,915	0	10	\$ 6,248,552	\$ 10,470,272
Groundwater Extraction & O&M for plant and treated injection	Ex-Situ Treatment (Chem Precip)	Opt 1	Alt 6_PIPE-WELL (10-40)	\$ 598,500	\$ 624,811	10	28	\$ 438,056	\$ 6,200,219	\$ 6,638,275	10	28	\$ 11,246,602	\$ 11,845,102
TOTAL				\$ 23,711,633		\$ 22,616,229 \$ 98,498,377 \$ 121,114,606					\$ 150,078,632 \$ 173,305,465			

\*Except for 80% mass reduction timeframe, durations based on fate & transport model performed by ARCADIS and represent time when the starting plume area has been reduced by 99 percent in the Remedial Area. The values in these tables represent the longer of Layers 1 and 3. Durations are capped at 1000 years for purposes of this costing and feasibility evaluation.

\*\* Timeframe to reach 1.2 ug/L shown above, to the extent achieving this criteria is feasible, is based on modeling.

OPINION OF PROBABLE COST	Hinkley Feasibility Study Including Addendum #2	Project Number: 36385
Cost Breakdown Detail by Component		Date: 22-Feb-11

ALT	Area	Opt No.	Sheet Name	Capital	Annual O&M	NPV to reach 3.1 ug/L Hexavalent Chromium*					Non-discounted Cash Flow to reach 3.1 ug/L Hexavalent Chromium*				
						Optimization		Capital	O&M x No. of years	Total Capital & O&M	Optimization		O&M x No. of years	Total Capital & O&M	
						Begin	End				Begin	End			
Alternative 2 - Containment															
Freshwater Injection	Northwest Freshwater Injection	Initial	NW Injection 40 gpm	\$ -	\$ 157,524	0	260	\$ -	\$ 4,967,739	\$ 4,967,739	0	260	\$ 40,956,366	\$ 40,956,366	
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (Current)	\$ -	\$ 420,200	0	25	\$ -	\$ 7,180,314	\$ 7,180,314	0	25	\$ 10,505,000	\$ 10,505,000	
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (75%)	\$ -	\$ 315,150	25	260	\$ -	\$ 4,553,429	\$ 4,553,429	25	260	\$ 74,060,250	\$ 74,060,250	
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (50%)	\$ -	\$ 210,100	0	0	\$ -	\$ -	\$ -	0	0	\$ -	\$ -	
Extraction for AU Application	Northern Extraction	Initial	Northern Extraction (2)	\$ 900,600	\$ 84,747	0	260	\$ 900,600	\$ 2,672,607	\$ 3,573,207	0	260	\$ 22,034,224	\$ 22,934,824	
Extraction for AU Application	SCRIA Extraction	Initial	SCRIA Extraction	\$ -	\$ 72,722	0	260	\$ -	\$ 2,293,393	\$ 2,293,393	0	260	\$ 18,907,806	\$ 18,907,806	
AU Application	Agricultural Units	Initial	AU Mods	\$ 240,000	\$ -	0	260	\$ 240,000	\$ -	\$ 240,000	0	260	\$ -	\$ 240,000	
AU Application	Agricultural Units	Initial	New AU	\$ 2,213,475	\$ -	0	260	\$ 2,213,475	\$ -	\$ 2,213,475	0	260	\$ -	\$ 2,213,475	
AU Application	Agricultural Units	Initial	AU O&M Summary	\$ -	\$ 339,181	0	260	\$ -	\$ 10,696,519	\$ 10,696,519	0	260	\$ 88,187,108	\$ 88,187,108	
Land Acquisition	Land Acquisition or Other	Initial	Alt 2 Land Acq	\$ 320,000	\$ -	0	260	\$ 320,000	\$ -	\$ 320,000	0	260	\$ -	\$ 320,000	
TOTAL				\$ 3,674,075		\$ 3,674,075 \$ 32,364,003 \$ 36,038,078					\$ 254,650,754 \$ 258,324,829				

OPINION OF PROBABLE COST	Hinkley Feasibility Study Including Addendum #2	Project Number: 36385
Cost Breakdown Detail by Component		Date: 22-Feb-11

ALT	Area	Opt No.	Sheet Name	Capital	Annual O&M	NPV to reach 3.1 ug/L Hexavalent Chromium*					Non-discounted Cash Flow to reach 3.1 ug/L Hexavalent Chromium*				
						Optimization		Capital	O&M x No. of years	Total Capital & O&M	Optimization		O&M x No. of years	Total Capital & O&M	
						Begin	End				Begin	End			

Alternative 3 - Plume-Wide In-Situ Treatment

Freshwater Injection	Northwest Freshwater Injection	Initial	NW Injection 40 gpm	\$ -	\$ 157,524	0	110	\$ -	\$ 4,808,750	\$ 4,808,750	0	110	\$ 17,327,693	\$ 17,327,693
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (Current)	\$ -	\$ 420,200	0	10	\$ -	\$ 3,553,493	\$ 3,553,493	0	10	\$ 4,202,000	\$ 4,202,000
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (75%)	\$ -	\$ 315,150	0	0	\$ -	\$ -	\$ -	0	0	\$ -	\$ -
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (50%)	\$ -	\$ 210,100	10	110	\$ -	\$ 4,636,976	\$ 4,636,976	10	110	\$ 21,010,000	\$ 21,010,000
Groundwater Extraction	Northern Extraction	Initial	Northern Extraction (3)	\$ 1,675,800	\$ 86,455	0	110	\$ 1,675,800	\$ 2,639,206	\$ 4,315,006	0	110	\$ 9,510,030	\$ 11,185,830
Groundwater Extraction	SCRIA Extraction	Initial	SCRIA Extraction	\$ -	\$ 72,722	0	110	\$ -	\$ 2,219,995	\$ 2,219,995	0	110	\$ 7,999,457	\$ 7,999,457
Groundwater Extraction	DVD Extraction	Initial	Alt 3_PIPE-WELL (0 - 5)	\$ -	\$ 76,992	0	5	\$ -	\$ 350,895	\$ 350,895	0	5	\$ 384,959	\$ 384,959
Groundwater Extraction	DVD Extraction	Opt 1	Alt 3_PIPE-WELL (5 - 10)	\$ -	\$ 76,992	5	10	\$ -	\$ 300,200	\$ 300,200	5	10	\$ 384,959	\$ 384,959
Groundwater Extraction	DVD Extraction	Opt 2	Alt 3_PIPE-WELL (10+)	\$ -	\$ 76,992	10	15	\$ -	\$ 256,828	\$ 256,828	10	15	\$ 384,959	\$ 384,959
Groundwater Extraction	DVD Extraction	Opt 3	Alt 3_PIPE-WELL (10+)	\$ -	\$ 76,992	15	110	\$ -	\$ 1,442,407	\$ 1,442,407	15	110	\$ 7,314,225	\$ 7,314,225
Groundwater Extraction	Gorman Extraction	Initial	Alt 3_PIPE-WELL (0 - 5)	\$ -	\$ 60,024	0	5	\$ -	\$ 273,564	\$ 273,564	0	5	\$ 300,121	\$ 300,121
Groundwater Extraction	Gorman Extraction	Opt 1	Alt 3_PIPE-WELL (5 - 10)	\$ -	\$ 60,024	5	10	\$ -	\$ 234,041	\$ 234,041	5	10	\$ 300,121	\$ 300,121
Groundwater Extraction	Gorman Extraction	Opt 2	Alt 3_PIPE-WELL (10+)	\$ -	\$ 60,024	10	15	\$ -	\$ 200,228	\$ 200,228	10	15	\$ 300,121	\$ 300,121
Groundwater Extraction	Gorman Extraction	Opt 3	Alt 3_PIPE-WELL (10+)	\$ -	\$ 60,024	15	110	\$ -	\$ 1,124,527	\$ 1,124,527	15	110	\$ 5,702,302	\$ 5,702,302
Dosed Injection	Northern Injection	Initial	Alt #3_0 to 5 yrs	\$ -	\$ -	0	5	\$ -	\$ -	\$ -	0	5	\$ -	\$ -
Dosed Injection	Northern Injection	Opt 1	Alt #3_5 to 10 yrs	\$ 4,642,022	\$ 666,354	5	10	\$ 3,971,367	\$ 2,598,188	\$ 6,569,555	5	10	\$ 3,331,771	\$ 7,973,792
Dosed Injection	Northern Injection	Opt 2	Alt #3_10 to 15 yrs	\$ 2,024,500	\$ 742,545	10	15	\$ 1,481,779	\$ 2,476,972	\$ 3,958,751	10	15	\$ 3,712,725	\$ 5,737,225
Dosed Injection	Northern Injection	Opt 3	Alt #3_15+ yrs	\$ -	\$ 495,898	15	110	\$ -	\$ 9,290,426	\$ 9,290,426	15	110	\$ 47,110,327	\$ 47,110,327
Dosed Injection	Central Area IRZ / Injection	Initial	Alt #3_0 to 5 yrs	\$ 1,353,685	\$ 918,288	0	5	\$ 1,353,685	\$ 4,185,153	\$ 5,538,838	0	5	\$ 4,591,438	\$ 5,945,123
Dosed Injection	Central Area IRZ / Injection	Opt 1	Alt #3_5 to 10 yrs	\$ -	\$ 918,288	5	10	\$ -	\$ 3,580,504	\$ 3,580,504	5	10	\$ 4,591,438	\$ 4,591,438
Dosed Injection	Central Area IRZ / Injection	Opt 2	Alt #3_10 to 15 yrs	\$ -	\$ -	10	15	\$ -	\$ -	\$ -	10	15	\$ -	\$ -
Dosed Injection	Central Area IRZ / Injection	Opt 3	Alt #3_15+ yrs	\$ -	\$ -	15	110	\$ -	\$ -	\$ -	15	110	\$ -	\$ -
Dosed Injection	SCRIA / Dosed Injection	Initial	Alt #3_0 to 5 yrs	\$ 2,115,069	\$ 643,490	0	5	\$ 2,115,069	\$ 2,932,746	\$ 5,047,815	0	5	\$ 3,217,450	\$ 5,332,519
Dosed Injection	SCRIA / Dosed Injection	Opt 1	Alt #3_5 to 10 yrs	\$ -	\$ 357,888	5	10	\$ -	\$ 1,395,444	\$ 1,395,444	5	10	\$ 1,789,439	\$ 1,789,439
Dosed Injection	SCRIA / Dosed Injection	Opt 2	Alt #3_10 to 15 yrs	\$ -	\$ -	10	15	\$ -	\$ -	\$ -	10	15	\$ -	\$ -
Dosed Injection	SCRIA / Dosed Injection	Opt 3	Alt #3_15+ yrs	\$ -	\$ 358,973	15	110	\$ -	\$ 6,725,201	\$ 6,725,201	15	110	\$ 34,102,463	\$ 34,102,463
Dosed Injection	Source Area IRZ / Injection	Initial	Alt #3_0 to 5 yrs	\$ 3,595,618	\$ 946,596	0	5	\$ 3,595,618	\$ 4,314,169	\$ 7,909,787	0	5	\$ 4,732,978	\$ 8,328,596
Dosed Injection	Source Area IRZ / Injection	Opt 1	Alt #3_5 to 10 yrs	\$ -	\$ -	5	10	\$ -	\$ -	\$ -	5	10	\$ -	\$ -
Dosed Injection	Source Area IRZ / Injection	Opt 2	Alt #3_10 to 15 yrs	\$ -	\$ -	10	15	\$ -	\$ -	\$ -	10	15	\$ -	\$ -
Dosed Injection	Source Area IRZ / Injection	Opt 3	Alt #3_15+ yrs	\$ -	\$ 669,535	15	110	\$ -	\$ 12,543,428	\$ 12,543,428	15	110	\$ 63,605,803	\$ 63,605,803
Dosed Injection	Northern Plume Fringe	Initial	Alt #3_0 to 5 yrs	\$ -	\$ 112,201	0	5	\$ -	\$ 511,362	\$ 511,362	0	5	\$ 561,004	\$ 561,004
Dosed Injection	Northern Plume Fringe	Opt 1	Alt #3_5 to 10 yrs	\$ -	\$ 112,201	5	10	\$ -	\$ 437,483	\$ 437,483	5	10	\$ 561,004	\$ 561,004
Dosed Injection	Northern Plume Fringe	Opt 2	Alt #3_10 to 15 yrs	\$ -	\$ 112,201	10	15	\$ -	\$ 374,278	\$ 374,278	10	15	\$ 561,004	\$ 561,004
Dosed Injection	Northern Plume Fringe	Opt 3	Alt #3_15+ yrs	\$ -	\$ 112,201	15	110	\$ -	\$ 2,102,031	\$ 2,102,031	15	110	\$ 10,659,080	\$ 10,659,080
Dosed Injection	Southeast and East Plume Fringe	Initial	Alt #3_0 to 5 yrs	\$ -	\$ 168,301	0	5	\$ -	\$ 767,043	\$ 767,043	0	5	\$ 841,506	\$ 841,506
Dosed Injection	Southeast and East Plume Fringe	Opt 1	Alt #3_5 to 10 yrs	\$ -	\$ 209,102	5	10	\$ -	\$ 815,310	\$ 815,310	5	10	\$ 1,045,508	\$ 1,045,508
Dosed Injection	Southeast and East Plume Fringe	Opt 2	Alt #3_10 to 15 yrs	\$ -	\$ 173,401	10	15	\$ -	\$ 578,430	\$ 578,430	10	15	\$ 867,007	\$ 867,007
Dosed Injection	Southeast and East Plume Fringe	Opt 3	Alt #3_15+ yrs	\$ -	\$ 173,401	15	110	\$ -	\$ 3,248,594	\$ 3,248,594	15	110	\$ 16,473,124	\$ 16,473,124
Dosed Injection	Southern Plume Fringe	Initial	Alt #3_0 to 5 yrs	\$ -	\$ 158,101	0	5	\$ -	\$ 720,556	\$ 720,556	0	5	\$ 790,506	\$ 790,506
Dosed Injection	Southern Plume Fringe	Opt 1	Alt #3_5 to 10 yrs	\$ -	\$ 249,902	5	10	\$ -	\$ 974,395	\$ 974,395	5	10	\$ 1,249,509	\$ 1,249,509
Dosed Injection	Southern Plume Fringe	Opt 2	Alt #3_10 to 15 yrs	\$ -	\$ 249,902	10	15	\$ -	\$ 833,619	\$ 833,619	10	15	\$ 1,249,509	\$ 1,249,509
Dosed Injection	Southern Plume Fringe	Opt 3	Alt #3_15+ yrs	\$ -	\$ 249,902	15	110	\$ -	\$ 4,681,797	\$ 4,681,797	15	110	\$ 23,740,678	\$ 23,740,678



OPINION OF PROBABLE COST	Hinkley Feasibility Study Including Addendum #2	Project Number: 36385
Cost Breakdown Detail by Component		Date: 22-Feb-11

ALT	Area	Opt No.	Sheet Name	Capital	Annual O&M	NPV to reach 3.1 ug/L Hexavalent Chromium*					Non-discounted Cash Flow to reach 3.1 ug/L Hexavalent Chromium*				
						Optimization		Capital	O&M x No. of years	Total Capital & O&M	Optimization		O&M x No. of years	Total Capital & O&M	
						Begin	End				Begin	End			
Dosed Injection	Northern Plume Fringe	Initial	Alt 3_PIPE-WELL (0 - 5)	\$ 1,745,667	\$ 146,300	0	5	\$ 1,745,667	\$ 666,771	\$ 2,412,438	0	5	\$ 731,500	\$ 2,477,167	
Dosed Injection	Northern Plume Fringe	Opt 1	Alt 3_PIPE-WELL (5 - 10)	\$ -	\$ 146,300	5	10	\$ -	\$ 570,440	\$ 570,440	5	10	\$ 731,500	\$ 731,500	
Dosed Injection	Northern Plume Fringe	Opt 2	Alt 3_PIPE-WELL (10+)	\$ -	\$ 146,300	10	15	\$ -	\$ 488,026	\$ 488,026	10	15	\$ 731,500	\$ 731,500	
Dosed Injection	Northern Plume Fringe	Opt 3	Alt 3_PIPE-WELL (10+)	\$ -	\$ 146,300	15	110	\$ -	\$ 2,740,864	\$ 2,740,864	15	110	\$ 13,898,500	\$ 13,898,500	
Dosed Injection	Southeast and East Plume Fringe	Initial	Alt 3_PIPE-WELL (0 - 5)	\$ 2,094,800	\$ 184,360	0	5	\$ 2,094,800	\$ 840,232	\$ 2,935,032	0	5	\$ 921,800	\$ 3,016,600	
Dosed Injection	Southeast and East Plume Fringe	Opt 1	Alt 3_PIPE-WELL (5 - 10)	\$ 1,401,273	\$ 265,540	5	10	\$ 1,198,824	\$ 1,035,370	\$ 2,234,194	5	10	\$ 1,327,700	\$ 2,728,973	
Dosed Injection	Southeast and East Plume Fringe	Opt 2	Alt 3_PIPE-WELL (10+)	\$ -	\$ 184,360	10	15	\$ -	\$ 614,986	\$ 614,986	10	15	\$ 921,800	\$ 921,800	
Dosed Injection	Southeast and East Plume Fringe	Opt 3	Alt #3_15+ yrs	\$ -	\$ 173,401	15	110	\$ -	\$ 3,248,594	\$ 3,248,594	15	110	\$ 16,473,124	\$ 16,473,124	
Dosed Injection	Southern Plume Fringe	Initial	Alt 3_PIPE-WELL (0 - 5)	\$ 2,443,933	\$ 211,420	0	5	\$ 2,443,933	\$ 963,560	\$ 3,407,493	0	5	\$ 1,057,100	\$ 3,501,033	
Dosed Injection	Southern Plume Fringe	Opt 1	Alt 3_PIPE-WELL (5 - 10)	\$ 800,727	\$ 319,660	5	10	\$ 685,042	\$ 1,246,389	\$ 1,931,432	5	10	\$ 1,598,300	\$ 2,399,027	
Dosed Injection	Southern Plume Fringe	Opt 2	Alt 3_PIPE-WELL (10+)	\$ -	\$ 319,660	10	15	\$ -	\$ 1,066,318	\$ 1,066,318	10	15	\$ 1,598,300	\$ 1,598,300	
Dosed Injection	Southern Plume Fringe	Opt 3	Alt 3_PIPE-WELL (10+)	\$ -	\$ 319,660	15	110	\$ -	\$ 5,988,684	\$ 5,988,684	15	110	\$ 30,367,700	\$ 30,367,700	
Land Acquisition	Land Acquisition or Other	Initial	Alt 3 Land Acq	\$ 20,000	\$ -	0	110	\$ 20,000	\$ -	\$ 20,000	0	110	\$ -	\$ 20,000	
TOTAL				\$ 23,913,094		\$ 22,381,585 \$ 107,598,472 \$ 129,980,057					\$ 374,865,044 \$ 398,778,137				

Alternative 4 - Core In-Site Treatment and Beneficial Agricultural Use																									
Freshwater Injection	Northwest Freshwater Injection	Initial	NW Injection 40 gpm	\$	-	\$	157,524	0	150	\$	-	\$	4,923,172	\$	4,923,172	0	150	\$	23,628,673	\$	23,628,673				
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (Current)	\$	-	\$	420,200	0	10	\$	-	\$	3,553,493	\$	3,553,493	0	10	\$	4,202,000	\$	4,202,000				
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (75%)	\$	-	\$	315,150	0	0	\$	-	\$	-	\$	-	0	0	\$	-	\$	-				
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (50%)	\$	-	\$	210,100	10	150	\$	-	\$	4,789,588	\$	4,789,588	10	150	\$	29,414,000	\$	29,414,000				
Extraction for AU Application	Northern Extraction	Initial	Northern Extraction (4)	\$	1,103,400	\$	84,747	0	150	\$	1,103,400	\$	2,648,630	\$	3,752,030	0	150	\$	12,712,052	\$	13,815,452				
Groundwater Extraction	SCRIA Extraction	Initial	SCRIA Extraction	\$	-	\$	72,722	0	150	\$	-	\$	2,272,818	\$	2,272,818	0	150	\$	10,908,350	\$	10,908,350				
Groundwater Extraction	SCRIA Extraction	Initial	Supplemental SCRIA Extraction	\$	-	\$	54,559	0	5	\$	-	\$	248,657	\$	248,657	0	5	\$	272,796	\$	272,796				
IRZ/Dosed Injection	Central Area IRZ / Injection	Initial	Alt #4_0 to 5 yrs	\$	1,337,296	\$	918,288	0	5	\$	1,337,296	\$	4,185,153	\$	5,522,449	0	5	\$	4,591,438	\$	5,928,734				
IRZ/Dosed Injection	SCRIA / Dosed Injection	Initial	Alt #4_0 to 5 yrs	\$	4,698,720	\$	476,809	0	5	\$	4,698,720	\$	2,173,086	\$	6,871,806	0	5	\$	2,384,044	\$	7,082,764				
IRZ/Dosed Injection	Source Area IRZ / Injection	Initial	Alt #4_0 to 5 yrs	\$	1,249,906	\$	814,241	0	5	\$	1,249,906	\$	3,710,952	\$	4,960,858	0	5	\$	4,071,203	\$	5,321,109				
AU Application	Agricultural Units	Initial	AU Mods	\$	240,000	\$	-	0	5	\$	240,000	\$	-	\$	240,000	0	5	\$	-	\$	240,000				
AU Application	Agricultural Units	Initial	New AU	\$	2,213,475	\$	-	0	5	\$	2,213,475	\$	-	\$	2,213,475	0	5	\$	-	\$	2,213,475				
AU Application	Agricultural Units	Initial	AU O&M Summary	\$	-	\$	319,636	0	5	\$	-	\$	1,456,759	\$	1,456,759	0	5	\$	1,598,178	\$	1,598,178				
AU Application	Agricultural Units	Opt 1	AU O&M Summary	\$	-	\$	339,181	5	150	\$	-	\$	9,054,718	\$	9,054,718	5	150	\$	49,181,272	\$	49,181,272				
Land Acquisition	Land Acquisition or Other	Initial	Alt 4 Land Acq	\$	337,600	\$	-	0	150	\$	337,600	\$	-	\$	337,600	0	150	\$	-	\$	337,600				
TOTAL				\$	11,180,397			\$				39,017,027		\$	50,197,424		\$				142,964,006		\$	154,144,403	

OPINION OF PROBABLE COST	Hinkley Feasibility Study Including Addendum #2	Project Number: 36385	
Cost Breakdown Detail by Component		Date: 22-Feb-11	

						NPV to reach 3.1 ug/L Hexavalent Chromium*					Non-discounted Cash Flow to reach 3.1 ug/L Hexavalent Chromium*				
						Optimization		Capital      O&M x No. of years      Total Capital & O&M			Optimization		O&M x No. of years      Total Capital & O&M		
						Begin	End				Begin	End			
ALT	Area	Opt No.	Sheet Name	Capital	Annual O&M	Begin	End					Begin	End		

Alternative 4A - Aggressive Core In-Site Treatment and Beneficial Agricultural Use																														
Freshwater Injection	Northwest Freshwater Injection	Initial	NW Injection 80 gpm	\$	-	\$	149,257	0	75	\$	-	\$	4,255,140	\$	4,255,140	0	75	\$	11,194,273	\$	11,194,273									
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (Current)	\$	-	\$	420,200	0	15	\$	-	\$	4,955,191	\$	4,955,191	0	15	\$	6,303,000	\$	6,303,000									
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (75%)	\$	-	\$	315,150	15	30	\$	-	\$	2,327,128	\$	2,327,128	15	30	\$	4,727,250	\$	4,727,250									
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (50%)	\$	-	\$	210,100	30	75	\$	-	\$	1,960,689	\$	1,960,689	30	75	\$	9,454,500	\$	9,454,500									
Extraction for AU Application	Northern Extraction	Initial	Northern Extraction (4A)	\$	2,623,560	\$	-	0	75	\$	2,623,560	\$	-	\$	2,623,560	0	75	\$	-	\$	2,623,560									
Groundwater Extraction	SCRIA Extraction	Initial	SCRIA Extraction (5 wells)	\$	-	\$	86,274	0	20	\$	-	\$	1,263,600	\$	1,263,600	0	20	\$	1,725,487	\$	1,725,487									
Groundwater Extraction	SCRIA Extraction	Initial	Supplemental SCRIA Extraction	\$	-	\$	54,559	0	20	\$	-	\$	799,092	\$	799,092	0	20	\$	1,091,185	\$	1,091,185									
Groundwater Extraction	SCRIA Extraction	Opt 2	DVD SCRIA Extr (60 gpm)	\$	742,200	\$	55,755	10	20	\$	543,234	\$	345,102	\$	888,335	10	20	\$	557,547	\$	1,299,747									
Groundwater Extraction	SCRIA Extraction	Opt 3	SCRIA Extraction for low dose	\$	-	\$	142,029	20	75	\$	-	\$	1,968,880	\$	1,968,880	20	75	\$	7,811,598	\$	7,811,598									
IRZ/Dosed Injection	Central Area IRZ / Injection	Initial	Alt #4A_0 to 5 yrs	\$	2,077,153	\$	904,760	0	5	\$	2,077,153	\$	4,123,498	\$	6,200,651	0	5	\$	4,523,798	\$	6,600,951									
IRZ/Dosed Injection	SCRIA / Dosed Injection	Initial	Alt #4A_0 to 5 yrs	\$	2,927,479	\$	478,213	0	5	\$	2,927,479	\$	2,179,485	\$	5,106,964	0	5	\$	2,391,064	\$	5,318,543									
IRZ/Dosed Injection	Source Area IRZ / Injection	Initial	Alt #4A_0 to 5 yrs	\$	3,083,759	\$	821,971	0	5	\$	3,083,759	\$	3,746,184	\$	6,829,944	0	5	\$	4,109,855	\$	7,193,615									
IRZ/Dosed Injection	Central Area IRZ / Injection	Opt 1	Alt #4A_5 to 10 yrs	\$	-	\$	904,760	5	10	\$	-	\$	3,527,757	\$	3,527,757	5	10	\$	4,523,798	\$	4,523,798									
IRZ/Dosed Injection	SCRIA / Dosed Injection	Opt 1	Alt #4A_5 to 10 yrs	\$	356,104	\$	380,628	5	10	\$	304,656	\$	1,484,111	\$	1,788,767	5	10	\$	1,903,140	\$	2,259,244									
IRZ/Dosed Injection	Source Area IRZ / Injection	Opt 1	Alt #4A_5 to 10 yrs	\$	69,296	\$	716,571	5	10	\$	59,284	\$	2,793,990	\$	2,853,274	5	10	\$	3,582,856	\$	3,652,152									
IRZ/Dosed Injection	Central Area IRZ / Injection	Opt 2	Alt #4A_10 to 20 yrs	\$	-	\$	904,760	10	20	\$	-	\$	5,600,133	\$	5,600,133	10	20	\$	9,047,595	\$	9,047,595									
IRZ/Dosed Injection	SCRIA / Dosed Injection	Opt 2	Alt #4A_10 to 20 yrs	\$	848,241	\$	416,508	10	20	\$	620,848	\$	2,578,035	\$	3,198,883	10	20	\$	4,165,083	\$	5,013,325									
IRZ/Dosed Injection	Source Area IRZ / Injection	Opt 2	Alt #4A_10 to 20 yrs	\$	327,581	\$	294,136	10	20	\$	239,764	\$	1,820,593	\$	2,060,357	10	20	\$	2,941,356	\$	3,268,937									
IRZ/Dosed Injection	Central Area IRZ / Injection	Opt 3	Alt #4A_20+ yrs	\$	-	\$	-	20	75	\$	-	\$	-	\$	-	20	75	\$	-	\$	-									
IRZ/Dosed Injection	SCRIA / Dosed Injection	Opt 3	Alt #4A_20+ yrs	\$	-	\$	88,342	20	75	\$	-	\$	1,224,643	\$	1,224,643	20	75	\$	4,858,812	\$	4,858,812									
IRZ/Dosed Injection	Source Area IRZ / Injection	Opt 3	Alt #4A_20+ yrs	\$	-	\$	38,842	20	75	\$	-	\$	538,448	\$	538,448	20	75	\$	2,136,312	\$	2,136,312									
AU Application	Agricultural Units	Initial	AU Mods	\$	240,000	\$	-	0	75	\$	240,000	\$	-	\$	240,000	0	75	\$	-	\$	240,000									
AU Application	Agricultural Units	Initial	New AU (Rev)	\$	3,469,796	\$	-	0	75	\$	3,469,796	\$	-	\$	3,469,796	0	75	\$	-	\$	3,469,796									
AU Application	Agricultural Units	Initial	AU O&M Summary	\$	-	\$	491,904	0	75	\$	-	\$	14,023,606	\$	14,023,606	0	75	\$	36,892,807	\$	36,892,807									
Land Acquisition	Land Acquisition or Other	Initial	Alt 4a Land Acq	\$	1,012,600	\$	-	0	75	\$	1,012,600	\$	-	\$	1,012,600	0	75	\$	-	\$	1,012,600									
TOTAL				\$	17,777,770					\$	17,202,134			\$	61,515,303		\$	78,717,436					\$	123,941,318			\$	141,719,088		

OPINION OF PROBABLE COST	Hinkley Feasibility Study Including Addendum #2	Project Number: 36385
Cost Breakdown Detail by Component		Date: 22-Feb-11

ALT	Area	Opt No.	Sheet Name	Capital	Annual O&M	NPV to reach 3.1 ug/L Hexavalent Chromium*					Non-discounted Cash Flow to reach 3.1 ug/L Hexavalent Chromium*				
						Optimization		Capital	O&M x No. of years	Total Capital & O&M	Optimization		O&M x No. of years	Total Capital & O&M	
						Begin	End				Begin	End			

Alternative 4B - Aggressive Core In-Site Treatment and Beneficial Agricultural Use with Targeted Pumping																	
Freshwater Injection	Northwest Freshwater Injection	Initial	NW Injection 80 gpm	\$	-	\$ 149,257	0	40	\$	-	\$ 3,357,164	\$ 3,357,164	0	40	\$	5,970,279	\$ 5,970,279
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (Current)	\$	-	\$ 420,200	0	15	\$	-	\$ 4,955,191	\$ 4,955,191	0	15	\$	6,303,000	\$ 6,303,000
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (75%)	\$	-	\$ 315,150	15	30	\$	-	\$ 2,327,128	\$ 2,327,128	15	30	\$	4,727,250	\$ 4,727,250
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (50%)	\$	-	\$ 210,100	30	40	\$	-	\$ 696,663	\$ 696,663	30	40	\$	2,101,000	\$ 2,101,000
Extraction for AU Application	Northern Extraction	Initial	Northern Extraction (4A)	\$	2,623,560	\$ -	0	40	\$	2,623,560	\$ -	\$ 2,623,560	0	40	\$	-	\$ 2,623,560
Extraction for AU Application	Northern Extraction	Initial	Northern Extraction (4B at 10)	\$	3,390,900	\$ 100,562	10	40	\$	2,481,879	\$ 1,411,472	\$ 3,893,352	10	40	\$	3,016,860	\$ 6,407,760
Groundwater Extraction	SCRIA Extraction	Initial	SCRIA Extraction (5 wells)	\$	-	\$ 86,274	0	20	\$	-	\$ 1,263,600	\$ 1,263,600	0	20	\$	1,725,487	\$ 1,725,487
Groundwater Extraction	SCRIA Extraction	Initial	Supplemental SCRIA Extraction	\$	-	\$ 54,559	0	20	\$	-	\$ 799,092	\$ 799,092	0	20	\$	1,091,185	\$ 1,091,185
Groundwater Extraction	SCRIA Extraction	Opt 2	DVD SCRIA Extr (60 gpm)	\$	742,200	\$ 55,755	10	20	\$	543,234	\$ 345,102	\$ 888,335	10	20	\$	557,547	\$ 1,299,747
Groundwater Extraction	SCRIA Extraction	Opt 3	SCRIA Extraction for low dose	\$	-	\$ 142,029	20	40	\$	-	\$ 1,114,389	\$ 1,114,389	20	40	\$	2,840,581	\$ 2,840,581
IRZ/Dosed Injection	Central Area IRZ / Injection	Initial	Alt #4A_0 to 5 yrs	\$	2,077,153	\$ 904,760	0	5	\$	2,077,153	\$ 4,123,498	\$ 6,200,651	0	5	\$	4,523,798	\$ 6,600,951
IRZ/Dosed Injection	SCRIA / Dosed Injection	Initial	Alt #4A_0 to 5 yrs	\$	2,927,479	\$ 478,213	0	5	\$	2,927,479	\$ 2,179,485	\$ 5,106,964	0	5	\$	2,391,064	\$ 5,318,543
IRZ/Dosed Injection	Source Area IRZ / Injection	Initial	Alt #4A_0 to 5 yrs	\$	3,083,759	\$ 821,971	0	5	\$	3,083,759	\$ 3,746,184	\$ 6,829,944	0	5	\$	4,109,855	\$ 7,193,615
IRZ/Dosed Injection	Central Area IRZ / Injection	Opt 1	Alt #4A_5 to 10 yrs	\$	-	\$ 904,760	5	10	\$	-	\$ 3,527,757	\$ 3,527,757	5	10	\$	4,523,798	\$ 4,523,798
IRZ/Dosed Injection	SCRIA / Dosed Injection	Opt 1	Alt #4A_5 to 10 yrs	\$	356,104	\$ 380,628	5	10	\$	304,656	\$ 1,484,111	\$ 1,788,767	5	10	\$	1,903,140	\$ 2,259,244
IRZ/Dosed Injection	Source Area IRZ / Injection	Opt 1	Alt #4A_5 to 10 yrs	\$	69,296	\$ 716,571	5	10	\$	59,284	\$ 2,793,990	\$ 2,853,274	5	10	\$	3,582,856	\$ 3,652,152
IRZ/Dosed Injection	Central Area IRZ / Injection	Opt 2	Alt #4A_10 to 20 yrs	\$	-	\$ 904,760	10	20	\$	-	\$ 5,600,133	\$ 5,600,133	10	20	\$	9,047,595	\$ 9,047,595
IRZ/Dosed Injection	SCRIA / Dosed Injection	Opt 2	Alt #4A_10 to 20 yrs	\$	848,241	\$ 416,508	10	20	\$	620,848	\$ 2,578,035	\$ 3,198,883	10	20	\$	4,165,083	\$ 5,013,325
IRZ/Dosed Injection	Source Area IRZ / Injection	Opt 2	Alt #4A_10 to 20 yrs	\$	327,581	\$ 294,136	10	20	\$	239,764	\$ 1,820,593	\$ 2,060,357	10	20	\$	2,941,356	\$ 3,268,937
IRZ/Dosed Injection	Central Area IRZ / Injection	Opt 3	Alt #4A_20+ yrs	\$	-	\$ -	20	40	\$	-	\$ -	\$ -	20	40	\$	-	\$ -
IRZ/Dosed Injection	SCRIA / Dosed Injection	Opt 3	Alt #4A_20+ yrs	\$	-	\$ 88,342	20	40	\$	-	\$ 693,150	\$ 693,150	20	40	\$	1,766,841	\$ 1,766,841
IRZ/Dosed Injection	Source Area IRZ / Injection	Opt 3	Alt #4A_20+ yrs	\$	-	\$ 38,842	20	40	\$	-	\$ 304,763	\$ 304,763	20	40	\$	776,841	\$ 776,841
AU Application	Agricultural Units	Initial	AU Mods	\$	240,000	\$ -	0	40	\$	240,000	\$ -	\$ 240,000	0	40	\$	-	\$ 240,000
AU Application	Agricultural Units	Initial	New AU (Rev)	\$	3,469,796	\$ -	0	40	\$	3,469,796	\$ -	\$ 3,469,796	0	40	\$	-	\$ 3,469,796
AU Application	Agricultural Units	Initial	AU O&M Summary	\$	-	\$ 491,904	0	40	\$	-	\$ 11,064,159	\$ 11,064,159	0	40	\$	19,676,164	\$ 19,676,164
Land Acquisition	Land Acquisition or Other	Initial	Alt 4a Land Acq	\$	1,012,600	\$ -	0	40	\$	1,012,600	\$ -	\$ 1,012,600	0	40	\$	-	\$ 1,012,600
TOTAL				\$	21,168,670		\$ 19,684,013		\$ 56,185,656	\$ 75,869,669			\$ 87,741,581	\$ 108,910,251			

OPINION OF PROBABLE COST	Hinkley Feasibility Study Including Addendum #2	Project Number: 36385
Cost Breakdown Detail by Component		Date: 22-Feb-11

ALT	Area	Opt No.	Sheet Name	Capital	Annual O&M	NPV to reach 3.1 ug/L Hexavalent Chromium*					Non-discounted Cash Flow to reach 3.1 ug/L Hexavalent Chromium*				
						Optimization		Capital	O&M x No. of years	Total Capital & O&M	Optimization		O&M x No. of years	Total Capital & O&M	
						Begin	End				Begin	End			

Alternative 5 - Plume-Wide Pump and Treat

Freshwater Injection	Northwest Freshwater Injection	Initial	NW Injection 40 gpm	\$	-	\$	157,524	0	140	\$	-	\$	4,906,304	\$	4,906,304	0	140	\$	22,053,428	\$	22,053,428
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (Current)	\$	-	\$	420,200	0	10	\$	-	\$	3,553,493	\$	3,553,493	0	10	\$	4,202,000	\$	4,202,000
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (75%)	\$	-	\$	315,150	0	0	\$	-	\$	-	\$	-	0	0	\$	-	\$	-
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (50%)	\$	-	\$	210,100	10	140	\$	-	\$	4,767,089	\$	4,767,089	10	140	\$	27,313,000	\$	27,313,000
Groundwater Extraction	Northern Extraction	Initial	Northern Extraction (5)	\$	1,675,800	\$	84,747	0	140	\$	1,675,800	\$	2,639,555	\$	4,315,355	0	140	\$	11,864,582	\$	13,540,382
Groundwater Extraction	SCRIA Extraction	Initial	SCRIA Extraction	\$	-	\$	72,722	0	140	\$	-	\$	2,265,031	\$	2,265,031	0	140	\$	10,181,126	\$	10,181,126
Groundwater Extraction	DVD Extraction	Initial	Alt 5_PIPE-WELL (0 - 10)	\$	-	\$	73,576	0	10	\$	-	\$	622,210	\$	622,210	0	10	\$	735,762	\$	735,762
Groundwater Extraction	DVD Extraction	Opt 1	Alt 5_PIPE-WELL (10 - 15)	\$	-	\$	73,576	10	15	\$	-	\$	245,435	\$	245,435	10	15	\$	367,881	\$	367,881
Groundwater Extraction	DVD Extraction	Opt 2	Alt 5_PIPE-WELL (15+)	\$	-	\$	73,576	15	140	\$	-	\$	1,423,982	\$	1,423,982	15	140	\$	9,197,029	\$	9,197,029
Groundwater Extraction	Gorman Extraction	Initial	Alt 5_PIPE-WELL (0 - 10)	\$	-	\$	58,316	0	10	\$	-	\$	493,163	\$	493,163	0	10	\$	583,164	\$	583,164
Groundwater Extraction	Gorman Extraction	Opt 1	Alt 5_PIPE-WELL (10 - 15)	\$	-	\$	58,316	10	15	\$	-	\$	194,531	\$	194,531	10	15	\$	291,582	\$	291,582
Groundwater Extraction	Gorman Extraction	Opt 2	Alt 5_PIPE-WELL (15+)	\$	-	\$	58,316	15	140	\$	-	\$	1,128,647	\$	1,128,647	15	140	\$	7,289,554	\$	7,289,554
Groundwater Extraction	Ranch or Other Extraction	Initial	Alt 5_PIPE-WELL (0 - 10)	\$	3,202,844	\$	126,247	0	10	\$	3,202,844	\$	1,067,631	\$	4,270,475	0	10	\$	1,262,472	\$	4,465,316
Groundwater Extraction	Ranch or Other Extraction	Opt 1	Alt 5_PIPE-WELL (10 - 15)	\$	677,400	\$	126,247	10	15	\$	495,805	\$	421,134	\$	916,939	10	15	\$	631,236	\$	1,308,636
Groundwater Extraction	Ranch or Other Extraction	Opt 2	Alt 5_PIPE-WELL (15+)	\$	885,600	\$	126,247	15	140	\$	554,544	\$	2,443,368	\$	2,997,912	15	140	\$	15,780,901	\$	16,666,501
Treated Injection	Northern Plume Fringe	Initial	Alt 5_PIPE-WELL (0 - 10)	\$	1,526,995	\$	146,300	0	10	\$	1,526,995	\$	1,237,211	\$	2,764,206	0	10	\$	1,463,000	\$	2,989,995
Treated Injection	Northern Plume Fringe	Opt 1	Alt 5_PIPE-WELL (10 - 15)	\$	-	\$	146,300	10	15	\$	-	\$	488,026	\$	488,026	10	15	\$	731,500	\$	731,500
Treated Injection	Northern Plume Fringe	Opt 2	Alt 5_PIPE-WELL (15+)	\$	-	\$	146,300	15	140	\$	-	\$	2,831,466	\$	2,831,466	15	140	\$	18,287,500	\$	18,287,500
Treated Injection	Southeast and East Plume Fringe	Initial	Alt 5_PIPE-WELL (0 - 10)	\$	6,718,776	\$	617,320	0	10	\$	6,718,776	\$	5,220,473	\$	11,939,249	0	10	\$	6,173,200	\$	12,891,976
Treated Injection	Southeast and East Plume Fringe	Opt 1	Alt 5_PIPE-WELL (10 - 15)	\$	-	\$	617,320	10	15	\$	-	\$	2,059,248	\$	2,059,248	10	15	\$	3,086,600	\$	3,086,600
Treated Injection	Southeast and East Plume Fringe	Opt 2	Alt 5_PIPE-WELL (15+)	\$	-	\$	617,320	15	140	\$	-	\$	11,947,509	\$	11,947,509	15	140	\$	77,165,000	\$	77,165,000
Treated Injection	Southern Plume Fringe	Initial	Alt 5_PIPE-WELL (0 - 10)	\$	3,359,388	\$	319,660	0	10	\$	3,359,388	\$	2,703,260	\$	6,062,648	0	10	\$	3,196,600	\$	6,555,988
Treated Injection	Southern Plume Fringe	Opt 1	Alt 5_PIPE-WELL (10 - 15)	\$	-	\$	319,660	10	15	\$	-	\$	1,066,318	\$	1,066,318	10	15	\$	1,598,300	\$	1,598,300
Treated Injection	Southern Plume Fringe	Opt 2	Alt 5_PIPE-WELL (15+)	\$	-	\$	319,660	15	140	\$	-	\$	6,186,647	\$	6,186,647	15	140	\$	39,957,500	\$	39,957,500
Treated Injection	Southwest Plume Fringe	Initial	Alt 5_PIPE-WELL (0 - 10)	\$	916,197	\$	92,180	0	10	\$	916,197	\$	779,536	\$	1,695,733	0	10	\$	921,800	\$	1,837,997
Treated Injection	Southwest Plume Fringe	Opt 1	Alt 5_PIPE-WELL (10 - 15)	\$	-	\$	92,180	10	15	\$	-	\$	307,493	\$	307,493	10	15	\$	460,900	\$	460,900
Treated Injection	Southwest Plume Fringe	Opt 2	Alt 5_PIPE-WELL (15+)	\$	-	\$	92,180	15	140	\$	-	\$	1,784,036	\$	1,784,036	15	140	\$	11,522,500	\$	11,522,500
Groundwater Treatment	Ex-Situ Treatment (Chem Precip)	Initial	EX-A	\$	8,012,515	\$	4,130,732	0	140	\$	8,012,515	\$	128,657,005	\$	136,669,520	0	140	\$	578,302,548	\$	586,315,063
Land Acquisition	Land Acquisition or Other	Initial	Alt 5 Land Acq	\$	454,000	\$	-	0	140	\$	454,000	\$	-	\$	454,000	0	140	\$	-	\$	454,000
TOTAL				\$	27,429,515			\$ 26,916,864 \$ 191,439,800 \$ 218,356,664				\$ 854,620,667 \$ 882,050,182									



OPINION OF PROBABLE COST	Hinkley Feasibility Study Including Addendum #2	Project Number: 36385
Cost Breakdown Detail by Component		Date: 22-Feb-11

						NPV to reach 3.1 ug/L Hexavalent Chromium*					Non-discounted Cash Flow to reach 3.1 ug/L Hexavalent Chromium*				
						Optimization					Optimization				
						Begin	End				Begin	End			
ALT	Area	Opt No.	Sheet Name	Capital	Annual O&M	Begin	End	Capital	O&M x No. of years	Total Capital & O&M	Begin	End	O&M x No. of years	Total Capital & O&M	

Combined Alternative															
Freshwater Injection	Northwest Freshwater Injection	Initial	NW Injection 80 gpm	\$ -	\$ 149,257	0	90	\$ -	\$ 4,424,586	\$ 4,424,586	0	90	\$ 13,433,127	\$ 13,433,127	
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (Current)	\$ -	\$ 420,200	0	15	\$ -	\$ 4,955,191	\$ 4,955,191	0	15	\$ 6,303,000	\$ 6,303,000	
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (75%)	\$ -	\$ 315,150	15	30	\$ -	\$ 2,327,128	\$ 2,327,128	15	30	\$ 4,727,250	\$ 4,727,250	
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (50%)	\$ -	\$ 210,100	30	90	\$ -	\$ 2,199,208	\$ 2,199,208	30	90	\$ 12,606,000	\$ 12,606,000	
Extraction for AU Application	Northern Extraction	Initial	Northern Extraction (Combined)	\$ 2,623,560	\$ -	0	90	\$ 2,623,560	\$ -	\$ 2,623,560	0	90	\$ -	\$ 2,623,560	
Groundwater Extraction	SCRIA Extraction	Initial	SCRIA Extraction (5 wells)	\$ -	\$ 86,274	0	40	\$ -	\$ 1,940,526	\$ 1,940,526	0	40	\$ 3,450,973	\$ 3,450,973	
Groundwater Extraction	SCRIA Extraction	Initial	Supplemental SCRIA Extraction	\$ -	\$ 54,559	0	40	\$ -	\$ 1,227,175	\$ 1,227,175	0	40	\$ 2,182,371	\$ 2,182,371	
Groundwater Extraction	SCRIA Extraction	Initial	DVD_SCRIA Extr (60 gpm)	\$ 742,200	\$ 55,755	10	40	\$ 543,234	\$ 782,564	\$ 1,325,798	10	40	\$ 1,672,642	\$ 2,414,842	
Groundwater Extraction	SCRIA Extraction	Initial	SCRIA Extraction for low dose	\$ -	\$ 142,029	40	90	\$ -	\$ 1,015,731	\$ 1,015,731	40	90	\$ 7,101,453	\$ 7,101,453	
IRZ/Dosed Injection	Central Area IRZ / Injection	Initial	Alt #6_0 to 10 yrs	\$ 2,394,426	\$ 904,760	0	10	\$ 2,394,426	\$ 7,651,254	\$ 10,045,681	0	10	\$ 9,047,595	\$ 11,442,022	
IRZ/Dosed Injection	SCRIA / Dosed Injection	Initial	Alt #6_0 to 10 yrs	\$ 3,374,635	\$ 478,213	0	10	\$ 3,374,635	\$ 4,044,089	\$ 7,418,724	0	10	\$ 4,782,128	\$ 8,156,763	
IRZ/Dosed Injection	Central Area IRZ / Injection	Opt 1	Alt #6_10 to 40 yrs	\$ -	\$ 904,760	10	40	\$ -	\$ 12,699,060	\$ 12,699,060	10	40	\$ 27,142,786	\$ 27,142,786	
IRZ/Dosed Injection	SCRIA / Dosed Injection	Opt 1	Alt #6_10 to 40 yrs	\$ 937,022	\$ 539,845	10	40	\$ 685,828	\$ 7,577,182	\$ 8,263,010	10	40	\$ 16,195,358	\$ 17,132,379	
IRZ/Dosed Injection	Central Area IRZ / Injection	Opt 2	Alt #6_40 to 42 yrs	\$ -	\$ -	40	42	\$ -	\$ -	\$ -	40	42	\$ -	\$ -	
IRZ/Dosed Injection	SCRIA / Dosed Injection	Opt 2	Alt #6_40 to 42 yrs	\$ 377,067	\$ 365,220	40	42	\$ 108,213	\$ 200,064	\$ 308,278	40	42	\$ 730,440	\$ 1,107,507	
IRZ/Dosed Injection	Source Area IRZ / Injection	Opt 2	Alt #6_40 to 42 yrs	\$ 107,733	\$ 652,153	40	42	\$ 30,918	\$ 357,244	\$ 388,162	40	42	\$ 1,304,306	\$ 1,412,039	
IRZ/Dosed Injection	SCRIA / Dosed Injection	Opt 3	Alt #6_42+ yrs	\$ -	\$ 88,342	42	90	\$ -	\$ 583,392	\$ 583,392	42	90	\$ 4,240,418	\$ 4,240,418	
IRZ/Dosed Injection	Source Area IRZ / Injection	Opt 3	Alt #6_42+ yrs	\$ -	\$ 38,842	42	90	\$ -	\$ 256,504	\$ 256,504	42	90	\$ 1,864,418	\$ 1,864,418	
AU Application	Agricultural Units	Initial	AU Mods	\$ 240,000	\$ -	0	90	\$ 240,000	\$ -	\$ 240,000	0	90	\$ -	\$ 240,000	
AU Application	Agricultural Units	Initial	New AU (Rev)	\$ 3,469,796	\$ -	0	90	\$ 3,469,796	\$ -	\$ 3,469,796	0	90	\$ -	\$ 3,469,796	
AU Application	Agricultural Units	Initial	AU O&M Summary	\$ -	\$ 491,904	0	90	\$ -	\$ 14,582,047	\$ 14,582,047	0	90	\$ 44,271,369	\$ 44,271,369	
Land Acquisition	Land Acquisition or Other	Initial	Alt 6 Land Acq	\$ 1,130,400	\$ -	0	90	\$ 1,130,400	\$ -	\$ 1,130,400	0	90	\$ -	\$ 1,130,400	
Groundwater Treatment	Ex-Situ Treatment (Chem Precip)	Initial	EX-A (200 gpm)	\$ 3,494,573	\$ 2,123,267	0	40	\$ 3,494,573	\$ 47,757,614	\$ 51,252,188	0	40	\$ 84,930,690	\$ 88,425,263	
Groundwater Extraction & O&M for plant and treated injection	Ex-Situ Treatment (Chem Precip)	Initial	Alt 6_PIPE-WELL (0-10)	\$ 4,221,720	\$ 624,855	0	10	\$ 4,221,720	\$ 5,284,195	\$ 9,505,915	0	10	\$ 6,248,552	\$ 10,470,272	
Groundwater Extraction & O&M for plant and treated injection	Ex-Situ Treatment (Chem Precip)	Opt 1	Alt 6_PIPE-WELL (10-40)	\$ 598,500	\$ 624,811	10	40	\$ 438,056	\$ 8,769,750	\$ 9,207,807	10	40	\$ 18,744,336	\$ 19,342,836	
TOTAL				\$ 23,711,633		\$ 22,755,361 \$ 128,634,507 \$ 151,389,868					\$ 270,979,211 \$ 294,690,844				

\*Except for 80% mass reduction timeframe, durations based on fate & transport model performed by ARCADIS and represent time when the starting plume area has been reduced by 99 percent in the Remedial Area. The values in these tables represent the longer of Layers 1 and 3. Durations are capped at 1000 years for purposes of this costing and feasibility evaluation.

\*\* Timeframe to reach 1.2 ug/L shown above, to the extent achieving this criteria is feasible, is based on modeling.

OPINION OF PROBABLE COST	Hinkley Feasibility Study Including Addendum #2	Project Number: 36385
Cost Breakdown Detail by Component		Date: 22-Feb-11

ALT	Area	Opt No.	Sheet Name	Capital	Annual O&M	NPV to reach 1.2 ug/L Hexavalent Chromium**					Non-discounted Cash Flow to reach 1.2 ug/L Hexavalent Chromium**			
						Optimization		Capital	O&M x No. of years	Total Capital & O&M	Optimization		O&M x No. of years	Total Capital & O&M
						Begin	End				Begin	End		
Alternative 2 - Containment														
Freshwater Injection	Northwest Freshwater Injection	Initial	NW Injection 40 gpm	\$ -	\$ 157,524	0	320	\$ -	\$ 4,968,998	\$ 4,968,998	0	320	\$ 50,407,835	\$ 50,407,835
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (Current)	\$ -	\$ 420,200	0	25	\$ -	\$ 7,180,314	\$ 7,180,314	0	25	\$ 10,505,000	\$ 10,505,000
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (75%)	\$ -	\$ 315,150	25	320	\$ -	\$ 4,555,947	\$ 4,555,947	25	320	\$ 92,969,250	\$ 92,969,250
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (50%)	\$ -	\$ 210,100	0	0	\$ -	\$ -	\$ -	0	0	\$ -	\$ -
Extraction for AU Application	Northern Extraction	Initial	Northern Extraction (2)	\$ 900,600	\$ 84,747	0	320	\$ 900,600	\$ 2,673,284	\$ 3,573,884	0	320	\$ 27,119,044	\$ 28,019,644
Extraction for AU Application	SCRIA Extraction	Initial	SCRIA Extraction	\$ -	\$ 72,722	0	320	\$ -	\$ 2,293,974	\$ 2,293,974	0	320	\$ 23,271,146	\$ 23,271,146
AU Application	Agricultural Units	Initial	AU Mods	\$ 240,000	\$ -	0	320	\$ 240,000	\$ -	\$ 240,000	0	320	\$ -	\$ 240,000
AU Application	Agricultural Units	Initial	New AU	\$ 2,213,475	\$ -	0	320	\$ 2,213,475	\$ -	\$ 2,213,475	0	320	\$ -	\$ 2,213,475
AU Application	Agricultural Units	Initial	AU O&M Summary	\$ -	\$ 339,181	0	320	\$ -	\$ 10,699,230	\$ 10,699,230	0	320	\$ 108,537,979	\$ 108,537,979
Land Acquisition	Land Acquisition or Other	Initial	Alt 2 Land Acq	\$ 320,000	\$ -	0	320	\$ 320,000	\$ -	\$ 320,000	0	320	\$ -	\$ 320,000
TOTAL				\$ 3,674,075				\$ 3,674,075	\$ 32,371,748	\$ 36,045,823			\$ 312,810,255	\$ 316,484,330

OPINION OF PROBABLE COST	Hinkley Feasibility Study Including Addendum #2	Project Number: 36385
Cost Breakdown Detail by Component		Date: 22-Feb-11

ALT	Area	Opt No.	Sheet Name	Capital	Annual O&M	NPV to reach 1.2 ug/L Hexavalent Chromium**					Non-discounted Cash Flow to reach 1.2 ug/L Hexavalent Chromium**			
						Optimization		Capital	O&M x No. of years	Total Capital & O&M	Optimization		O&M x No. of years	Total Capital & O&M
						Begin	End				Begin	End		

Alternative 3 - Plume-Wide In-Situ Treatment

Freshwater Injection	Northwest Freshwater Injection	Initial	NW Injection 40 gpm	\$ -	\$ 157,524	0	180	\$ -	\$ 4,951,169	\$ 4,951,169	0	180	\$ 28,354,407	\$ 28,354,407
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (Current)	\$ -	\$ 420,200	0	10	\$ -	\$ 3,553,493	\$ 3,553,493	0	10	\$ 4,202,000	\$ 4,202,000
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (75%)	\$ -	\$ 315,150	0	0	\$ -	\$ -	\$ -	0	0	\$ -	\$ -
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (50%)	\$ -	\$ 210,100	10	180	\$ -	\$ 4,826,928	\$ 4,826,928	10	180	\$ 35,717,000	\$ 35,717,000
Groundwater Extraction	Northern Extraction	Initial	Northern Extraction (3)	\$ 1,675,800	\$ 86,455	0	180	\$ 1,675,800	\$ 2,717,370	\$ 4,393,170	0	180	\$ 15,561,867	\$ 17,237,667
Groundwater Extraction	SCRIA Extraction	Initial	SCRIA Extraction	\$ -	\$ 72,722	0	180	\$ -	\$ 2,285,743	\$ 2,285,743	0	180	\$ 13,090,020	\$ 13,090,020
Groundwater Extraction	DVD Extraction	Initial	Alt 3_PIPE-WELL (0 - 5)	\$ -	\$ 76,992	0	5	\$ -	\$ 350,895	\$ 350,895	0	5	\$ 384,959	\$ 384,959
Groundwater Extraction	DVD Extraction	Opt 1	Alt 3_PIPE-WELL (5 - 10)	\$ -	\$ 76,992	5	10	\$ -	\$ 300,200	\$ 300,200	5	10	\$ 384,959	\$ 384,959
Groundwater Extraction	DVD Extraction	Opt 2	Alt 3_PIPE-WELL (10+)	\$ -	\$ 76,992	10	15	\$ -	\$ 256,828	\$ 256,828	10	15	\$ 384,959	\$ 384,959
Groundwater Extraction	DVD Extraction	Opt 3	Alt 3_PIPE-WELL (10+)	\$ -	\$ 76,992	15	180	\$ -	\$ 1,512,015	\$ 1,512,015	15	180	\$ 12,703,653	\$ 12,703,653
Groundwater Extraction	Gorman Extraction	Initial	Alt 3_PIPE-WELL (0 - 5)	\$ -	\$ 60,024	0	5	\$ -	\$ 273,564	\$ 273,564	0	5	\$ 300,121	\$ 300,121
Groundwater Extraction	Gorman Extraction	Opt 1	Alt 3_PIPE-WELL (5 - 10)	\$ -	\$ 60,024	5	10	\$ -	\$ 234,041	\$ 234,041	5	10	\$ 300,121	\$ 300,121
Groundwater Extraction	Gorman Extraction	Opt 2	Alt 3_PIPE-WELL (10+)	\$ -	\$ 60,024	10	15	\$ -	\$ 200,228	\$ 200,228	10	15	\$ 300,121	\$ 300,121
Groundwater Extraction	Gorman Extraction	Opt 3	Alt 3_PIPE-WELL (10+)	\$ -	\$ 60,024	15	180	\$ -	\$ 1,178,795	\$ 1,178,795	15	180	\$ 9,903,999	\$ 9,903,999
Dosed Injection	Northern Injection	Initial	Alt #3_0 to 5 yrs	\$ -	\$ -	0	5	\$ -	\$ -	\$ -	0	5	\$ -	\$ -
Dosed Injection	Northern Injection	Opt 1	Alt #3_5 to 10 yrs	\$ 4,642,022	\$ 666,354	5	10	\$ 3,971,367	\$ 2,598,188	\$ 6,569,555	5	10	\$ 3,331,771	\$ 7,973,792
Dosed Injection	Northern Injection	Opt 2	Alt #3_10 to 15 yrs	\$ 2,024,500	\$ 742,545	10	15	\$ 1,481,779	\$ 2,476,972	\$ 3,958,751	10	15	\$ 3,712,725	\$ 5,737,225
Dosed Injection	Northern Injection	Opt 3	Alt #3_15+ yrs	\$ -	\$ 495,898	15	180	\$ -	\$ 9,738,769	\$ 9,738,769	15	180	\$ 81,823,199	\$ 81,823,199
Dosed Injection	Central Area IRZ / Injection	Initial	Alt #3_0 to 5 yrs	\$ 1,353,685	\$ 918,288	0	5	\$ 1,353,685	\$ 4,185,153	\$ 5,538,838	0	5	\$ 4,591,438	\$ 5,945,123
Dosed Injection	Central Area IRZ / Injection	Opt 1	Alt #3_5 to 10 yrs	\$ -	\$ 918,288	5	10	\$ -	\$ 3,580,504	\$ 3,580,504	5	10	\$ 4,591,438	\$ 4,591,438
Dosed Injection	Central Area IRZ / Injection	Opt 2	Alt #3_10 to 15 yrs	\$ -	\$ -	10	15	\$ -	\$ -	\$ -	10	15	\$ -	\$ -
Dosed Injection	Central Area IRZ / Injection	Opt 3	Alt #3_15+ yrs	\$ -	\$ -	15	180	\$ -	\$ -	\$ -	15	180	\$ -	\$ -
Dosed Injection	SCRIA / Dosed Injection	Initial	Alt #3_0 to 5 yrs	\$ 2,115,069	\$ 643,490	0	5	\$ 2,115,069	\$ 2,932,746	\$ 5,047,815	0	5	\$ 3,217,450	\$ 5,332,519
Dosed Injection	SCRIA / Dosed Injection	Opt 1	Alt #3_5 to 10 yrs	\$ -	\$ 357,888	5	10	\$ -	\$ 1,395,444	\$ 1,395,444	5	10	\$ 1,789,439	\$ 1,789,439
Dosed Injection	SCRIA / Dosed Injection	Opt 2	Alt #3_10 to 15 yrs	\$ -	\$ -	10	15	\$ -	\$ -	\$ -	10	15	\$ -	\$ -
Dosed Injection	SCRIA / Dosed Injection	Opt 3	Alt #3_15+ yrs	\$ -	\$ 358,973	15	180	\$ -	\$ 7,049,750	\$ 7,049,750	15	180	\$ 59,230,594	\$ 59,230,594
Dosed Injection	Source Area IRZ / Injection	Initial	Alt #3_0 to 5 yrs	\$ 3,595,618	\$ 946,596	0	5	\$ 3,595,618	\$ 4,314,169	\$ 7,909,787	0	5	\$ 4,732,978	\$ 8,328,596
Dosed Injection	Source Area IRZ / Injection	Opt 1	Alt #3_5 to 10 yrs	\$ -	\$ -	5	10	\$ -	\$ -	\$ -	5	10	\$ -	\$ -
Dosed Injection	Source Area IRZ / Injection	Opt 2	Alt #3_10 to 15 yrs	\$ -	\$ -	10	15	\$ -	\$ -	\$ -	10	15	\$ -	\$ -
Dosed Injection	Source Area IRZ / Injection	Opt 3	Alt #3_15+ yrs	\$ -	\$ 669,535	15	180	\$ -	\$ 13,148,756	\$ 13,148,756	15	180	\$ 110,473,236	\$ 110,473,236
Dosed Injection	Northern Plume Fringe	Initial	Alt #3_0 to 5 yrs	\$ -	\$ 112,201	0	5	\$ -	\$ 511,362	\$ 511,362	0	5	\$ 561,004	\$ 561,004
Dosed Injection	Northern Plume Fringe	Opt 1	Alt #3_5 to 10 yrs	\$ -	\$ 112,201	5	10	\$ -	\$ 437,483	\$ 437,483	5	10	\$ 561,004	\$ 561,004
Dosed Injection	Northern Plume Fringe	Opt 2	Alt #3_10 to 15 yrs	\$ -	\$ 112,201	10	15	\$ -	\$ 374,278	\$ 374,278	10	15	\$ 561,004	\$ 561,004
Dosed Injection	Northern Plume Fringe	Opt 3	Alt #3_15+ yrs	\$ -	\$ 112,201	15	180	\$ -	\$ 2,203,473	\$ 2,203,473	15	180	\$ 18,513,139	\$ 18,513,139
Dosed Injection	Southeast and East Plume Fringe	Initial	Alt #3_0 to 5 yrs	\$ -	\$ 168,301	0	5	\$ -	\$ 767,043	\$ 767,043	0	5	\$ 841,506	\$ 841,506
Dosed Injection	Southeast and East Plume Fringe	Opt 1	Alt #3_5 to 10 yrs	\$ -	\$ 209,102	5	10	\$ -	\$ 815,310	\$ 815,310	5	10	\$ 1,045,508	\$ 1,045,508
Dosed Injection	Southeast and East Plume Fringe	Opt 2	Alt #3_10 to 15 yrs	\$ -	\$ 173,401	10	15	\$ -	\$ 578,430	\$ 578,430	10	15	\$ 867,007	\$ 867,007
Dosed Injection	Southeast and East Plume Fringe	Opt 3	Alt #3_15+ yrs	\$ -	\$ 173,401	15	180	\$ -	\$ 3,405,367	\$ 3,405,367	15	180	\$ 28,611,215	\$ 28,611,215
Dosed Injection	Southern Plume Fringe	Initial	Alt #3_0 to 5 yrs	\$ -	\$ 158,101	0	5	\$ -	\$ 720,556	\$ 720,556	0	5	\$ 790,506	\$ 790,506
Dosed Injection	Southern Plume Fringe	Opt 1	Alt #3_5 to 10 yrs	\$ -	\$ 249,902	5	10	\$ -	\$ 974,395	\$ 974,395	5	10	\$ 1,249,509	\$ 1,249,509
Dosed Injection	Southern Plume Fringe	Opt 2	Alt #3_10 to 15 yrs	\$ -	\$ 249,902	10	15	\$ -	\$ 833,619	\$ 833,619	10	15	\$ 1,249,509	\$ 1,249,509
Dosed Injection	Southern Plume Fringe	Opt 3	Alt #3_15+ yrs	\$ -	\$ 249,902	15	180	\$ -	\$ 4,907,735	\$ 4,907,735	15	180	\$ 41,233,810	\$ 41,233,810

OPINION OF PROBABLE COST	Hinkley Feasibility Study Including Addendum #2	Project Number: 36385
Cost Breakdown Detail by Component		Date: 22-Feb-11

ALT	Area	Opt No.	Sheet Name	Capital	Annual O&M	NPV to reach 1.2 ug/L Hexavalent Chromium**					Non-discounted Cash Flow to reach 1.2 ug/L Hexavalent Chromium**				
						Optimization		Capital	O&M x No. of years	Total Capital & O&M	Optimization		O&M x No. of years	Total Capital & O&M	
						Begin	End				Begin	End			
Dosed Injection	Northern Plume Fringe	Initial	Alt 3_PIPE-WELL (0 - 5)	\$ 1,745,667	\$ 146,300	0	5	\$ 1,745,667	\$ 666,771	\$ 2,412,438	0	5	\$ 731,500	\$ 2,477,167	
Dosed Injection	Northern Plume Fringe	Opt 1	Alt 3_PIPE-WELL (5 - 10)	\$ -	\$ 146,300	5	10	\$ -	\$ 570,440	\$ 570,440	5	10	\$ 731,500	\$ 731,500	
Dosed Injection	Northern Plume Fringe	Opt 2	Alt 3_PIPE-WELL (10+)	\$ -	\$ 146,300	10	15	\$ -	\$ 488,026	\$ 488,026	10	15	\$ 731,500	\$ 731,500	
Dosed Injection	Northern Plume Fringe	Opt 3	Alt 3_PIPE-WELL (10+)	\$ -	\$ 146,300	15	180	\$ -	\$ 2,873,134	\$ 2,873,134	15	180	\$ 24,139,500	\$ 24,139,500	
Dosed Injection	Southeast and East Plume Fringe	Initial	Alt 3_PIPE-WELL (0 - 5)	\$ 2,094,800	\$ 184,360	0	5	\$ 2,094,800	\$ 840,232	\$ 2,935,032	0	5	\$ 921,800	\$ 3,016,600	
Dosed Injection	Southeast and East Plume Fringe	Opt 1	Alt 3_PIPE-WELL (5 - 10)	\$ 1,401,273	\$ 265,540	5	10	\$ 1,198,824	\$ 1,035,370	\$ 2,234,194	5	10	\$ 1,327,700	\$ 2,728,973	
Dosed Injection	Southeast and East Plume Fringe	Opt 2	Alt 3_PIPE-WELL (10+)	\$ -	\$ 184,360	10	15	\$ -	\$ 614,986	\$ 614,986	10	15	\$ 921,800	\$ 921,800	
Dosed Injection	Southeast and East Plume Fringe	Opt 3	Alt #3_15+ yrs	\$ -	\$ 173,401	15	180	\$ -	\$ 3,405,367	\$ 3,405,367	15	180	\$ 28,611,215	\$ 28,611,215	
Dosed Injection	Southern Plume Fringe	Initial	Alt 3_PIPE-WELL (0 - 5)	\$ 2,443,933	\$ 211,420	0	5	\$ 2,443,933	\$ 963,560	\$ 3,407,493	0	5	\$ 1,057,100	\$ 3,501,033	
Dosed Injection	Southern Plume Fringe	Opt 1	Alt 3_PIPE-WELL (5 - 10)	\$ 800,727	\$ 319,660	5	10	\$ 685,042	\$ 1,246,389	\$ 1,931,432	5	10	\$ 1,598,300	\$ 2,399,027	
Dosed Injection	Southern Plume Fringe	Opt 2	Alt 3_PIPE-WELL (10+)	\$ -	\$ 319,660	10	15	\$ -	\$ 1,066,318	\$ 1,066,318	10	15	\$ 1,598,300	\$ 1,598,300	
Dosed Injection	Southern Plume Fringe	Opt 3	Alt 3_PIPE-WELL (10+)	\$ -	\$ 319,660	15	180	\$ -	\$ 6,277,690	\$ 6,277,690	15	180	\$ 52,743,900	\$ 52,743,900	
Land Acquisition	Land Acquisition or Other	Initial	Alt 3 Land Acq	\$ 20,000	\$ -	0	180	\$ 20,000	\$ -	\$ 20,000	0	180	\$ -	\$ 20,000	
TOTAL				\$ 23,913,094		\$ 22,381,585 \$ 110,639,053 \$ 133,020,637					\$ 610,281,292 \$ 634,194,386				

Alternative 4 - Core In-Site Treatment and Beneficial Agricultural Use															
Freshwater Injection	Northwest Freshwater Injection	Initial	NW Injection 40 gpm	\$ -	\$ 157,524	0	220	\$ -	\$ 4,964,044	\$ 4,964,044	0	220	\$ 34,655,387	\$ 34,655,387	
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (Current)	\$ -	\$ 420,200	0	10	\$ -	\$ 3,553,493	\$ 3,553,493	0	10	\$ 4,202,000	\$ 4,202,000	
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (75%)	\$ -	\$ 315,150	0	0	\$ -	\$ -	\$ -	0	0	\$ -	\$ -	
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (50%)	\$ -	\$ 210,100	10	220	\$ -	\$ 4,844,101	\$ 4,844,101	10	220	\$ 44,121,000	\$ 44,121,000	
Extraction for AU Application	Northern Extraction	Initial	Northern Extraction (4)	\$ 1,103,400	\$ 84,747	0	220	\$ 1,103,400	\$ 2,670,619	\$ 3,774,019	0	220	\$ 18,644,343	\$ 19,747,743	
Groundwater Extraction	SCRIA Extraction	Initial	SCRIA Extraction	\$ -	\$ 72,722	0	220	\$ -	\$ 2,291,687	\$ 2,291,687	0	220	\$ 15,998,913	\$ 15,998,913	
Groundwater Extraction	SCRIA Extraction	Initial	Supplemental SCRIA Extraction	\$ -	\$ 54,559	0	5	\$ -	\$ 248,657	\$ 248,657	0	5	\$ 272,796	\$ 272,796	
IRZ/Dosed Injection	Central Area IRZ / Injection	Initial	Alt #4_0 to 5 yrs	\$ 1,337,296	\$ 918,288	0	5	\$ 1,337,296	\$ 4,185,153	\$ 5,522,449	0	5	\$ 4,591,438	\$ 5,928,734	
IRZ/Dosed Injection	SCRIA / Dosed Injection	Initial	Alt #4_0 to 5 yrs	\$ 4,698,720	\$ 476,809	0	5	\$ 4,698,720	\$ 2,173,086	\$ 6,871,806	0	5	\$ 2,384,044	\$ 7,082,764	
IRZ/Dosed Injection	Source Area IRZ / Injection	Initial	Alt #4_0 to 5 yrs	\$ 1,249,906	\$ 814,241	0	5	\$ 1,249,906	\$ 3,710,952	\$ 4,960,858	0	5	\$ 4,071,203	\$ 5,321,109	
AU Application	Agricultural Units	Initial	AU Mods	\$ 240,000	\$ -	0	5	\$ 240,000	\$ -	\$ 240,000	0	5	\$ -	\$ 240,000	
AU Application	Agricultural Units	Initial	New AU	\$ 2,213,475	\$ -	0	5	\$ 2,213,475	\$ -	\$ 2,213,475	0	5	\$ -	\$ 2,213,475	
AU Application	Agricultural Units	Initial	AU O&M Summary	\$ -	\$ 319,636	0	5	\$ -	\$ 1,456,759	\$ 1,456,759	0	5	\$ 1,598,178	\$ 1,598,178	
AU Application	Agricultural Units	Opt 1	AU O&M Summary	\$ -	\$ 339,181	5	220	\$ -	\$ 9,142,724	\$ 9,142,724	5	220	\$ 72,923,955	\$ 72,923,955	
Land Acquisition	Land Acquisition or Other	Initial	Alt 4 Land Acq	\$ 337,600	\$ -	0	220	\$ 337,600	\$ -	\$ 337,600	0	220	\$ -	\$ 337,600	
TOTAL				\$ 11,180,397		\$ 39,241,277 \$ 50,421,674					\$ 203,463,257 \$ 214,643,654				



OPINION OF PROBABLE COST	Hinkley Feasibility Study Including Addendum #2	Project Number: 36385
Cost Breakdown Detail by Component		Date: 22-Feb-11

ALT	Area	Opt No.	Sheet Name	Capital	Annual O&M	NPV to reach 1.2 ug/L Hexavalent Chromium**					Non-discounted Cash Flow to reach 1.2 ug/L Hexavalent Chromium**				
						Optimization		Capital	O&M x No. of years	Total Capital & O&M	Optimization		O&M x No. of years	Total Capital & O&M	
						Begin	End				Begin	End			

Alternative 4A - Aggressive Core In-Site Treatment and Beneficial Agricultural Use

Freshwater Injection	Northwest Freshwater Injection	Initial	NW Injection 80 gpm	\$ -	\$ 149,257	0	130	\$ -	\$ 4,626,965	\$ 4,626,965	0	130	\$ 19,403,406	\$ 19,403,406
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (Current)	\$ -	\$ 420,200	0	15	\$ -	\$ 4,955,191	\$ 4,955,191	0	15	\$ 6,303,000	\$ 6,303,000
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (75%)	\$ -	\$ 315,150	15	30	\$ -	\$ 2,327,128	\$ 2,327,128	15	30	\$ 4,727,250	\$ 4,727,250
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (50%)	\$ -	\$ 210,100	30	130	\$ -	\$ 2,484,084	\$ 2,484,084	30	130	\$ 21,010,000	\$ 21,010,000
Extraction for AU Application	Northern Extraction	Initial	Northern Extraction (4A)	\$ 2,623,560	\$ -	0	130	\$ 2,623,560	\$ -	\$ 2,623,560	0	130	\$ -	\$ 2,623,560
Groundwater Extraction	SCRIA Extraction	Initial	SCRIA Extraction (5 wells)	\$ -	\$ 86,274	0	20	\$ -	\$ 1,263,600	\$ 1,263,600	0	20	\$ 1,725,487	\$ 1,725,487
Groundwater Extraction	SCRIA Extraction	Initial	Supplemental SCRIA Extraction	\$ -	\$ 54,559	0	20	\$ -	\$ 799,092	\$ 799,092	0	20	\$ 1,091,185	\$ 1,091,185
Groundwater Extraction	SCRIA Extraction	Opt 2	DVD SCRIA Extr (60 gpm)	\$ 742,200	\$ 55,755	10	20	\$ 543,234	\$ 345,102	\$ 888,335	10	20	\$ 557,547	\$ 1,299,747
Groundwater Extraction	SCRIA Extraction	Opt 3	SCRIA Extraction for low dose	\$ -	\$ 142,029	20	130	\$ -	\$ 2,322,698	\$ 2,322,698	20	130	\$ 15,623,196	\$ 15,623,196
IRZ/Dosed Injection	Central Area IRZ / Injection	Initial	Alt #4A_0 to 5 yrs	\$ 2,077,153	\$ 904,760	0	5	\$ 2,077,153	\$ 4,123,498	\$ 6,200,651	0	5	\$ 4,523,798	\$ 6,600,951
IRZ/Dosed Injection	SCRIA / Dosed Injection	Initial	Alt #4A_0 to 5 yrs	\$ 2,927,479	\$ 478,213	0	5	\$ 2,927,479	\$ 2,179,485	\$ 5,106,964	0	5	\$ 2,391,064	\$ 5,318,543
IRZ/Dosed Injection	Source Area IRZ / Injection	Initial	Alt #4A_0 to 5 yrs	\$ 3,083,759	\$ 821,971	0	5	\$ 3,083,759	\$ 3,746,184	\$ 6,829,944	0	5	\$ 4,109,855	\$ 7,193,615
IRZ/Dosed Injection	Central Area IRZ / Injection	Opt 1	Alt #4A_5 to 10 yrs	\$ -	\$ 904,760	5	10	\$ -	\$ 3,527,757	\$ 3,527,757	5	10	\$ 4,523,798	\$ 4,523,798
IRZ/Dosed Injection	SCRIA / Dosed Injection	Opt 1	Alt #4A_5 to 10 yrs	\$ 356,104	\$ 380,628	5	10	\$ 304,656	\$ 1,484,111	\$ 1,788,767	5	10	\$ 1,903,140	\$ 2,259,244
IRZ/Dosed Injection	Source Area IRZ / Injection	Opt 1	Alt #4A_5 to 10 yrs	\$ 69,296	\$ 716,571	5	10	\$ 59,284	\$ 2,793,990	\$ 2,853,274	5	10	\$ 3,582,856	\$ 3,652,152
IRZ/Dosed Injection	Central Area IRZ / Injection	Opt 2	Alt #4A_10 to 20 yrs	\$ -	\$ 904,760	10	20	\$ -	\$ 5,600,133	\$ 5,600,133	10	20	\$ 9,047,595	\$ 9,047,595
IRZ/Dosed Injection	SCRIA / Dosed Injection	Opt 2	Alt #4A_10 to 20 yrs	\$ 848,241	\$ 416,508	10	20	\$ 620,848	\$ 2,578,035	\$ 3,198,883	10	20	\$ 4,165,083	\$ 5,013,325
IRZ/Dosed Injection	Source Area IRZ / Injection	Opt 2	Alt #4A_10 to 20 yrs	\$ 327,581	\$ 294,136	10	20	\$ 239,764	\$ 1,820,593	\$ 2,060,357	10	20	\$ 2,941,356	\$ 3,268,937
IRZ/Dosed Injection	Central Area IRZ / Injection	Opt 3	Alt #4A_20+ yrs	\$ -	\$ -	20	130	\$ -	\$ -	\$ -	20	130	\$ -	\$ -
IRZ/Dosed Injection	SCRIA / Dosed Injection	Opt 3	Alt #4A_20+ yrs	\$ -	\$ 88,342	20	130	\$ -	\$ 1,444,718	\$ 1,444,718	20	130	\$ 9,717,625	\$ 9,717,625
IRZ/Dosed Injection	Source Area IRZ / Injection	Opt 3	Alt #4A_20+ yrs	\$ -	\$ 38,842	20	130	\$ -	\$ 635,210	\$ 635,210	20	130	\$ 4,272,625	\$ 4,272,625
AU Application	Agricultural Units	Initial	AU Mods	\$ 240,000	\$ -	0	130	\$ 240,000	\$ -	\$ 240,000	0	130	\$ -	\$ 240,000
AU Application	Agricultural Units	Initial	New AU (Rev)	\$ 3,469,796	\$ -	0	130	\$ 3,469,796	\$ -	\$ 3,469,796	0	130	\$ -	\$ 3,469,796
AU Application	Agricultural Units	Initial	AU O&M Summary	\$ -	\$ 491,904	0	130	\$ -	\$ 15,249,022	\$ 15,249,022	0	130	\$ 63,947,533	\$ 63,947,533
Land Acquisition	Land Acquisition or Other	Initial	Alt 4a Land Acq	\$ 1,012,600	\$ -	0	130	\$ 1,012,600	\$ -	\$ 1,012,600	0	130	\$ -	\$ 1,012,600
TOTAL				\$ 17,777,770		\$ 17,202,134 \$ 64,306,594 \$ 81,508,727					\$ 185,567,400 \$ 203,345,170			

OPINION OF PROBABLE COST	Hinkley Feasibility Study Including Addendum #2	Project Number: 36385
Cost Breakdown Detail by Component		Date: 22-Feb-11

ALT	Area	Opt No.	Sheet Name	Capital	Annual O&M	NPV to reach 1.2 ug/L Hexavalent Chromium**					Non-discounted Cash Flow to reach 1.2 ug/L Hexavalent Chromium**				
						Optimization		Capital	O&M x No. of years	Total Capital & O&M	Optimization		O&M x No. of years	Total Capital & O&M	
						Begin	End				Begin	End			

Alternative 4B - Aggressive Core In-Site Treatment and Beneficial Agricultural Use with Targeted Pumping																						
Freshwater Injection	Northwest Freshwater Injection	Initial	NW Injection 80 gpm	\$	-	\$	149,257	0	95	\$	-	\$	4,465,593	\$	4,465,593	0	95	\$	14,179,412	\$	14,179,412	
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (Current)	\$	-	\$	420,200	0	15	\$	-	\$	4,955,191	\$	4,955,191	0	15	\$	6,303,000	\$	6,303,000	
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (75%)	\$	-	\$	315,150	15	30	\$	-	\$	2,327,128	\$	2,327,128	15	30	\$	4,727,250	\$	4,727,250	
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (50%)	\$	-	\$	210,100	30	95	\$	-	\$	2,256,931	\$	2,256,931	30	95	\$	13,656,500	\$	13,656,500	
Extraction for AU Application	Northern Extraction	Initial	Northern Extraction (4A)	\$	2,623,560	\$	-	0	95	\$	2,623,560	\$	-	\$	2,623,560	0	95	\$	-	\$	2,623,560	
Extraction for AU Application	Northern Extraction	Initial	Northern Extraction (4B at 10)	\$	3,390,900	\$	100,562	10	95	\$	2,481,879	\$	2,158,277	\$	4,640,157	10	95	\$	8,547,770	\$	11,938,670	
Groundwater Extraction	SCRIA Extraction	Initial	SCRIA Extraction (5 wells)	\$	-	\$	86,274	0	20	\$	-	\$	1,263,600	\$	1,263,600	0	20	\$	1,725,487	\$	1,725,487	
Groundwater Extraction	SCRIA Extraction	Initial	Supplemental SCRIA Extraction	\$	-	\$	54,559	0	20	\$	-	\$	799,092	\$	799,092	0	20	\$	1,091,185	\$	1,091,185	
Groundwater Extraction	SCRIA Extraction	Opt 2	DVD SCRIA Extr (60 gpm)	\$	742,200	\$	55,755	10	20	\$	543,234	\$	345,102	\$	888,335	10	20	\$	557,547	\$	1,299,747	
Groundwater Extraction	SCRIA Extraction	Opt 3	SCRIA Extraction for low dose	\$	-	\$	142,029	20	95	\$	-	\$	2,169,141	\$	2,169,141	20	95	\$	10,652,179	\$	10,652,179	
IRZ/Dosed Injection	Central Area IRZ / Injection	Initial	Alt #4A_0 to 5 yrs	\$	2,077,153	\$	904,760	0	5	\$	2,077,153	\$	4,123,498	\$	6,200,651	0	5	\$	4,523,798	\$	6,600,951	
IRZ/Dosed Injection	SCRIA / Dosed Injection	Initial	Alt #4A_0 to 5 yrs	\$	2,927,479	\$	478,213	0	5	\$	2,927,479	\$	2,179,485	\$	5,106,964	0	5	\$	2,391,064	\$	5,318,543	
IRZ/Dosed Injection	Source Area IRZ / Injection	Initial	Alt #4A_0 to 5 yrs	\$	3,083,759	\$	821,971	0	5	\$	3,083,759	\$	3,746,184	\$	6,829,944	0	5	\$	4,109,855	\$	7,193,615	
IRZ/Dosed Injection	Central Area IRZ / Injection	Opt 1	Alt #4A_5 to 10 yrs	\$	-	\$	904,760	5	10	\$	-	\$	3,527,757	\$	3,527,757	5	10	\$	4,523,798	\$	4,523,798	
IRZ/Dosed Injection	SCRIA / Dosed Injection	Opt 1	Alt #4A_5 to 10 yrs	\$	356,104	\$	380,628	5	10	\$	304,656	\$	1,484,111	\$	1,788,767	5	10	\$	1,903,140	\$	2,259,244	
IRZ/Dosed Injection	Source Area IRZ / Injection	Opt 1	Alt #4A_5 to 10 yrs	\$	69,296	\$	716,571	5	10	\$	59,284	\$	2,793,990	\$	2,853,274	5	10	\$	3,582,856	\$	3,652,152	
IRZ/Dosed Injection	Central Area IRZ / Injection	Opt 2	Alt #4A_10 to 20 yrs	\$	-	\$	904,760	10	20	\$	-	\$	5,600,133	\$	5,600,133	10	20	\$	9,047,595	\$	9,047,595	
IRZ/Dosed Injection	SCRIA / Dosed Injection	Opt 2	Alt #4A_10 to 20 yrs	\$	848,241	\$	416,508	10	20	\$	620,848	\$	2,578,035	\$	3,198,883	10	20	\$	4,165,083	\$	5,013,325	
IRZ/Dosed Injection	Source Area IRZ / Injection	Opt 2	Alt #4A_10 to 20 yrs	\$	327,581	\$	294,136	10	20	\$	239,764	\$	1,820,593	\$	2,060,357	10	20	\$	2,941,356	\$	3,268,937	
IRZ/Dosed Injection	Central Area IRZ / Injection	Opt 3	Alt #4A_20+ yrs	\$	-	\$	-	20	95	\$	-	\$	-	\$	-	20	95	\$	-	\$	-	
IRZ/Dosed Injection	SCRIA / Dosed Injection	Opt 3	Alt #4A_20+ yrs	\$	-	\$	88,342	20	95	\$	-	\$	1,349,205	\$	1,349,205	20	95	\$	6,625,653	\$	6,625,653	
IRZ/Dosed Injection	Source Area IRZ / Injection	Opt 3	Alt #4A_20+ yrs	\$	-	\$	38,842	20	95	\$	-	\$	593,216	\$	593,216	20	95	\$	2,913,153	\$	2,913,153	
AU Application	Agricultural Units	Initial	AU Mods	\$	240,000	\$	-	0	95	\$	240,000	\$	-	\$	240,000	0	95	\$	-	\$	240,000	
AU Application	Agricultural Units	Initial	New AU (Rev)	\$	3,469,796	\$	-	0	95	\$	3,469,796	\$	-	\$	3,469,796	0	95	\$	-	\$	3,469,796	
AU Application	Agricultural Units	Initial	AU O&M Summary	\$	-	\$	491,904	0	95	\$	-	\$	14,717,193	\$	14,717,193	0	95	\$	46,730,889	\$	46,730,889	
Land Acquisition	Land Acquisition or Other	Initial	Alt 4a Land Acq	\$	1,012,600	\$	-	0	95	\$	1,012,600	\$	-	\$	1,012,600	0	95	\$	-	\$	1,012,600	
TOTAL				\$	21,168,670					\$	19,684,013	\$	65,253,455	\$	84,937,468				\$	154,898,573	\$	176,067,242

OPINION OF PROBABLE COST	Hinkley Feasibility Study Including Addendum #2	Project Number: 36385
Cost Breakdown Detail by Component		Date: 22-Feb-11

ALT	Area	Opt No.	Sheet Name	Capital	Annual O&M	NPV to reach 1.2 ug/L Hexavalent Chromium**					Non-discounted Cash Flow to reach 1.2 ug/L Hexavalent Chromium**				
						Optimization		Capital	O&M x No. of years	Total Capital & O&M	Optimization		O&M x No. of years	Total Capital & O&M	
						Begin	End				Begin	End			

Alternative 5 - Plume-Wide Pump and Treat

Freshwater Injection	Northwest Freshwater Injection	Initial	NW Injection 40 gpm	\$	-	\$	157,524	0	210	\$	-	\$	4,962,146	\$	4,962,146	0	210	\$	33,080,142	\$	33,080,142
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (Current)	\$	-	\$	420,200	0	10	\$	-	\$	3,553,493	\$	3,553,493	0	10	\$	4,202,000	\$	4,202,000
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (75%)	\$	-	\$	315,150	0	0	\$	-	\$	-	\$	-	0	0	\$	-	\$	-
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (50%)	\$	-	\$	210,100	10	210	\$	-	\$	4,841,570	\$	4,841,570	10	210	\$	42,020,000	\$	42,020,000
Groundwater Extraction	Northern Extraction	Initial	Northern Extraction (5)	\$	1,675,800	\$	84,747	0	210	\$	1,675,800	\$	2,669,598	\$	4,345,398	0	210	\$	17,796,873	\$	19,472,673
Groundwater Extraction	SCRIA Extraction	Initial	SCRIA Extraction	\$	-	\$	72,722	0	210	\$	-	\$	2,290,811	\$	2,290,811	0	210	\$	15,271,690	\$	15,271,690
Groundwater Extraction	DVD Extraction	Initial	Alt 5_PIPE-WELL (0 - 10)	\$	-	\$	73,576	0	10	\$	-	\$	622,210	\$	622,210	0	10	\$	735,762	\$	735,762
Groundwater Extraction	DVD Extraction	Opt 1	Alt 5_PIPE-WELL (10 - 15)	\$	-	\$	73,576	10	15	\$	-	\$	245,435	\$	245,435	10	15	\$	367,881	\$	367,881
Groundwater Extraction	DVD Extraction	Opt 2	Alt 5_PIPE-WELL (15+)	\$	-	\$	73,576	15	210	\$	-	\$	1,450,065	\$	1,450,065	15	210	\$	14,347,366	\$	14,347,366
Groundwater Extraction	Gorman Extraction	Initial	Alt 5_PIPE-WELL (0 - 10)	\$	-	\$	58,316	0	10	\$	-	\$	493,163	\$	493,163	0	10	\$	583,164	\$	583,164
Groundwater Extraction	Gorman Extraction	Opt 1	Alt 5_PIPE-WELL (10 - 15)	\$	-	\$	58,316	10	15	\$	-	\$	194,531	\$	194,531	10	15	\$	291,582	\$	291,582
Groundwater Extraction	Gorman Extraction	Opt 2	Alt 5_PIPE-WELL (15+)	\$	-	\$	58,316	15	210	\$	-	\$	1,149,320	\$	1,149,320	15	210	\$	11,371,704	\$	11,371,704
Groundwater Extraction	Ranch or Other Extraction	Initial	Alt 5_PIPE-WELL (0 - 10)	\$	3,202,844	\$	126,247	0	10	\$	3,202,844	\$	1,067,631	\$	4,270,475	0	10	\$	1,262,472	\$	4,465,316
Groundwater Extraction	Ranch or Other Extraction	Opt 1	Alt 5_PIPE-WELL (10 - 15)	\$	677,400	\$	126,247	10	15	\$	495,805	\$	421,134	\$	916,939	10	15	\$	631,236	\$	1,308,636
Groundwater Extraction	Ranch or Other Extraction	Opt 2	Alt 5_PIPE-WELL (15+)	\$	885,600	\$	126,247	15	210	\$	554,544	\$	2,488,122	\$	3,042,666	15	210	\$	24,618,206	\$	25,503,806
Treated Injection	Northern Plume Fringe	Initial	Alt 5_PIPE-WELL (0 - 10)	\$	1,526,995	\$	146,300	0	10	\$	1,526,995	\$	1,237,211	\$	2,764,206	0	10	\$	1,463,000	\$	2,989,995
Treated Injection	Northern Plume Fringe	Opt 1	Alt 5_PIPE-WELL (10 - 15)	\$	-	\$	146,300	10	15	\$	-	\$	488,026	\$	488,026	10	15	\$	731,500	\$	731,500
Treated Injection	Northern Plume Fringe	Opt 2	Alt 5_PIPE-WELL (15+)	\$	-	\$	146,300	15	210	\$	-	\$	2,883,329	\$	2,883,329	15	210	\$	28,528,500	\$	28,528,500
Treated Injection	Southeast and East Plume Fringe	Initial	Alt 5_PIPE-WELL (0 - 10)	\$	6,718,776	\$	617,320	0	10	\$	6,718,776	\$	5,220,473	\$	11,939,249	0	10	\$	6,173,200	\$	12,891,976
Treated Injection	Southeast and East Plume Fringe	Opt 1	Alt 5_PIPE-WELL (10 - 15)	\$	-	\$	617,320	10	15	\$	-	\$	2,059,248	\$	2,059,248	10	15	\$	3,086,600	\$	3,086,600
Treated Injection	Southeast and East Plume Fringe	Opt 2	Alt 5_PIPE-WELL (15+)	\$	-	\$	617,320	15	210	\$	-	\$	12,166,349	\$	12,166,349	15	210	\$	120,377,400	\$	120,377,400
Treated Injection	Southern Plume Fringe	Initial	Alt 5_PIPE-WELL (0 - 10)	\$	3,359,388	\$	319,660	0	10	\$	3,359,388	\$	2,703,260	\$	6,062,648	0	10	\$	3,196,600	\$	6,555,988
Treated Injection	Southern Plume Fringe	Opt 1	Alt 5_PIPE-WELL (10 - 15)	\$	-	\$	319,660	10	15	\$	-	\$	1,066,318	\$	1,066,318	10	15	\$	1,598,300	\$	1,598,300
Treated Injection	Southern Plume Fringe	Opt 2	Alt 5_PIPE-WELL (15+)	\$	-	\$	319,660	15	210	\$	-	\$	6,299,966	\$	6,299,966	15	210	\$	62,333,700	\$	62,333,700
Treated Injection	Southwest Plume Fringe	Initial	Alt 5_PIPE-WELL (0 - 10)	\$	916,197	\$	92,180	0	10	\$	916,197	\$	779,536	\$	1,695,733	0	10	\$	921,800	\$	1,837,997
Treated Injection	Southwest Plume Fringe	Opt 1	Alt 5_PIPE-WELL (10 - 15)	\$	-	\$	92,180	10	15	\$	-	\$	307,493	\$	307,493	10	15	\$	460,900	\$	460,900
Treated Injection	Southwest Plume Fringe	Opt 2	Alt 5_PIPE-WELL (15+)	\$	-	\$	92,180	15	210	\$	-	\$	1,816,714	\$	1,816,714	15	210	\$	17,975,100	\$	17,975,100
Groundwater Treatment	Ex-Situ Treatment (Chem Precip)	Initial	EX-A	\$	8,012,515	\$	4,130,732	0	210	\$	8,012,515	\$	130,121,346	\$	138,133,861	0	210	\$	867,453,822	\$	875,466,337
Land Acquisition	Land Acquisition or Other	Initial	Alt 5 Land Acq	\$	454,000	\$	-	0	210	\$	454,000	\$	-	\$	454,000	0	210	\$	-	\$	454,000
TOTAL				\$	27,429,515		\$ 26,916,864				\$ 193,598,496	\$ 220,515,361	\$ 1,280,880,500				\$ 1,308,310,015				

OPINION OF PROBABLE COST	Hinkley Feasibility Study Including Addendum #2	Project Number: 36385
Cost Breakdown Detail by Component		Date: 22-Feb-11

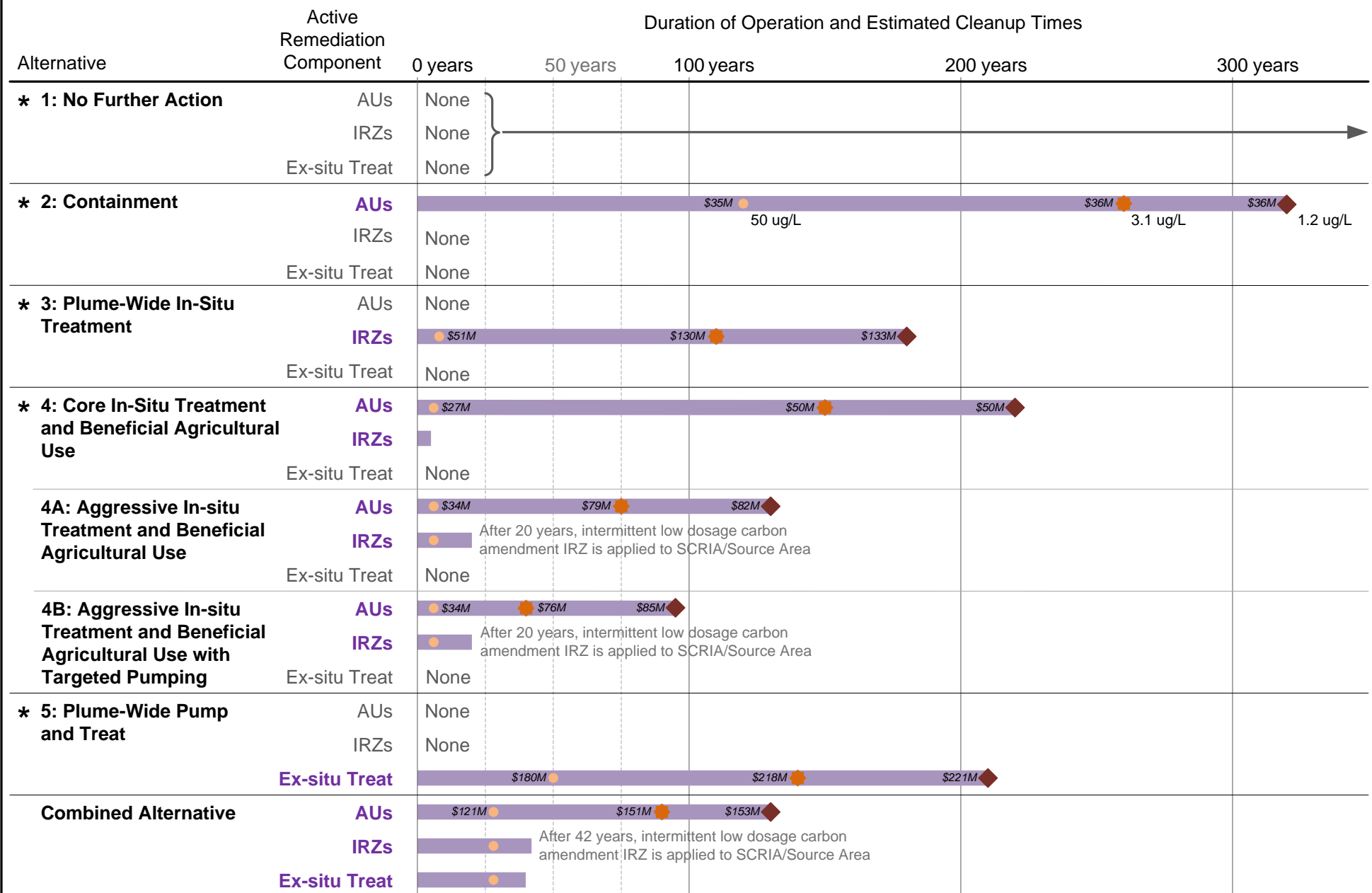
ALT	Area	Opt No.	Sheet Name	Capital	Annual O&M	NPV to reach 1.2 ug/L Hexavalent Chromium**					Non-discounted Cash Flow to reach 1.2 ug/L Hexavalent Chromium**			
						Optimization		Capital	O&M x No. of years	Total Capital & O&M	Optimization		O&M x No. of years	Total Capital & O&M
						Begin	End				Begin	End		

Combined Alternative														
Freshwater Injection	Northwest Freshwater Injection	Initial	NW Injection 80 gpm	\$ -	\$ 149,257	0	130	\$ -	\$ 4,626,965	\$ 4,626,965	0	130	\$ 19,403,406	\$ 19,403,406
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (Current)	\$ -	\$ 420,200	0	15	\$ -	\$ 4,955,191	\$ 4,955,191	0	15	\$ 6,303,000	\$ 6,303,000
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (75%)	\$ -	\$ 315,150	15	30	\$ -	\$ 2,327,128	\$ 2,327,128	15	30	\$ 4,727,250	\$ 4,727,250
Groundwater Monitoring Program	GMP Including BCMP	Initial	GMP&BCMP (50%)	\$ -	\$ 210,100	30	130	\$ -	\$ 2,484,084	\$ 2,484,084	30	130	\$ 21,010,000	\$ 21,010,000
Extraction for AU Application	Northern Extraction	Initial	Northern Extraction (Combined)	\$ 2,623,560	\$ -	0	130	\$ 2,623,560	\$ -	\$ 2,623,560	0	130	\$ -	\$ 2,623,560
Groundwater Extraction	SCRIA Extraction	Initial	SCRIA Extraction (5 wells)	\$ -	\$ 86,274	0	40	\$ -	\$ 1,940,526	\$ 1,940,526	0	40	\$ 3,450,973	\$ 3,450,973
Groundwater Extraction	SCRIA Extraction	Initial	Supplemental SCRIA Extraction	\$ -	\$ 54,559	0	40	\$ -	\$ 1,227,175	\$ 1,227,175	0	40	\$ 2,182,371	\$ 2,182,371
Groundwater Extraction	SCRIA Extraction	Initial	DVD_SCRIA Extr (60 gpm)	\$ 742,200	\$ 55,755	10	40	\$ 543,234	\$ 782,564	\$ 1,325,798	10	40	\$ 1,672,642	\$ 2,414,842
Groundwater Extraction	SCRIA Extraction	Initial	SCRIA Extraction for low dose	\$ -	\$ 142,029	40	130	\$ -	\$ 1,208,309	\$ 1,208,309	40	130	\$ 12,782,615	\$ 12,782,615
IRZ/Dosed Injection	Central Area IRZ / Injection	Initial	Alt #6_0 to 10 yrs	\$ 2,394,426	\$ 904,760	0	10	\$ 2,394,426	\$ 7,651,254	\$ 10,045,681	0	10	\$ 9,047,595	\$ 11,442,022
IRZ/Dosed Injection	SCRIA / Dosed Injection	Initial	Alt #6_0 to 10 yrs	\$ 3,374,635	\$ 478,213	0	10	\$ 3,374,635	\$ 4,044,089	\$ 7,418,724	0	10	\$ 4,782,128	\$ 8,156,763
IRZ/Dosed Injection	Central Area IRZ / Injection	Opt 1	Alt #6_10 to 40 yrs	\$ -	\$ 904,760	10	40	\$ -	\$ 12,699,060	\$ 12,699,060	10	40	\$ 27,142,786	\$ 27,142,786
IRZ/Dosed Injection	SCRIA / Dosed Injection	Opt 1	Alt #6_10 to 40 yrs	\$ 937,022	\$ 539,845	10	40	\$ 685,828	\$ 7,577,182	\$ 8,263,010	10	40	\$ 16,195,358	\$ 17,132,379
IRZ/Dosed Injection	Central Area IRZ / Injection	Opt 2	Alt #6_40 to 42 yrs	\$ -	\$ -	40	42	\$ -	\$ -	\$ -	40	42	\$ -	\$ -
IRZ/Dosed Injection	SCRIA / Dosed Injection	Opt 2	Alt #6_40 to 42 yrs	\$ 377,067	\$ 365,220	40	42	\$ 108,213	\$ 200,064	\$ 308,278	40	42	\$ 730,440	\$ 1,107,507
IRZ/Dosed Injection	Source Area IRZ / Injection	Opt 2	Alt #6_40 to 42 yrs	\$ 107,733	\$ 652,153	40	42	\$ 30,918	\$ 357,244	\$ 388,162	40	42	\$ 1,304,306	\$ 1,412,039
IRZ/Dosed Injection	SCRIA / Dosed Injection	Opt 3	Alt #6_42+ yrs	\$ -	\$ 88,342	42	130	\$ -	\$ 703,175	\$ 703,175	42	130	\$ 7,774,100	\$ 7,774,100
IRZ/Dosed Injection	Source Area IRZ / Injection	Opt 3	Alt #6_42+ yrs	\$ -	\$ 38,842	42	130	\$ -	\$ 309,170	\$ 309,170	42	130	\$ 3,418,100	\$ 3,418,100
AU Application	Agricultural Units	Initial	AU Mods	\$ 240,000	\$ -	0	130	\$ 240,000	\$ -	\$ 240,000	0	130	\$ -	\$ 240,000
AU Application	Agricultural Units	Initial	New AU (Rev)	\$ 3,469,796	\$ -	0	130	\$ 3,469,796	\$ -	\$ 3,469,796	0	130	\$ -	\$ 3,469,796
AU Application	Agricultural Units	Initial	AU O&M Summary	\$ -	\$ 491,904	0	130	\$ -	\$ 15,249,022	\$ 15,249,022	0	130	\$ 63,947,533	\$ 63,947,533
Land Acquisition	Land Acquisition or Other	Initial	Alt 6 Land Acq	\$ 1,130,400	\$ -	0	130	\$ 1,130,400	\$ -	\$ 1,130,400	0	130	\$ -	\$ 1,130,400
Groundwater Treatment	Ex-Situ Treatment (Chem Precip)	Initial	EX-A (200 gpm)	\$ 3,494,573	\$ 2,123,267	0	40	\$ 3,494,573	\$ 47,757,614	\$ 51,252,188	0	40	\$ 84,930,690	\$ 88,425,263
Groundwater Extraction & O&M for plant and treated injection	Ex-Situ Treatment (Chem Precip)	Initial	Alt 6_PIPE-WELL (0-10)	\$ 4,221,720	\$ 624,855	0	10	\$ 4,221,720	\$ 5,284,195	\$ 9,505,915	0	10	\$ 6,248,552	\$ 10,470,272
Groundwater Extraction & O&M for plant and treated injection	Ex-Situ Treatment (Chem Precip)	Opt 1	Alt 6_PIPE-WELL (10-40)	\$ 598,500	\$ 624,811	10	40	\$ 438,056	\$ 8,769,750	\$ 9,207,807	10	40	\$ 18,744,336	\$ 19,342,836
TOTAL				\$ 23,711,633		\$ 22,755,361 \$ 130,153,763 \$ 152,909,124					\$ 315,798,180 \$ 339,509,813			

\*Except for 80% mass reduction timeframe, durations based on fate & transport model performed by ARCADIS and represent time when the starting plume area has been reduced by 99 percent in the Remedial Area. The values in these tables represent the longer of Layers 1 and 3. Durations are capped at 1000 years for purposes of this costing and feasibility evaluation.

\*\* Timeframe to reach 1.2 ug/L shown above, to the extent achieving this criteria is feasible, is based on modeling.

# Remedial Alternative Summary – Active Remediation Components and Durations



\* Alternative per FS (8/30/2010)  
 AUs = Agricultural Units  
 IRZs = In-situ Reactive Zones  
 Ex-situ Treat = Includes pump and ex-situ treatment system

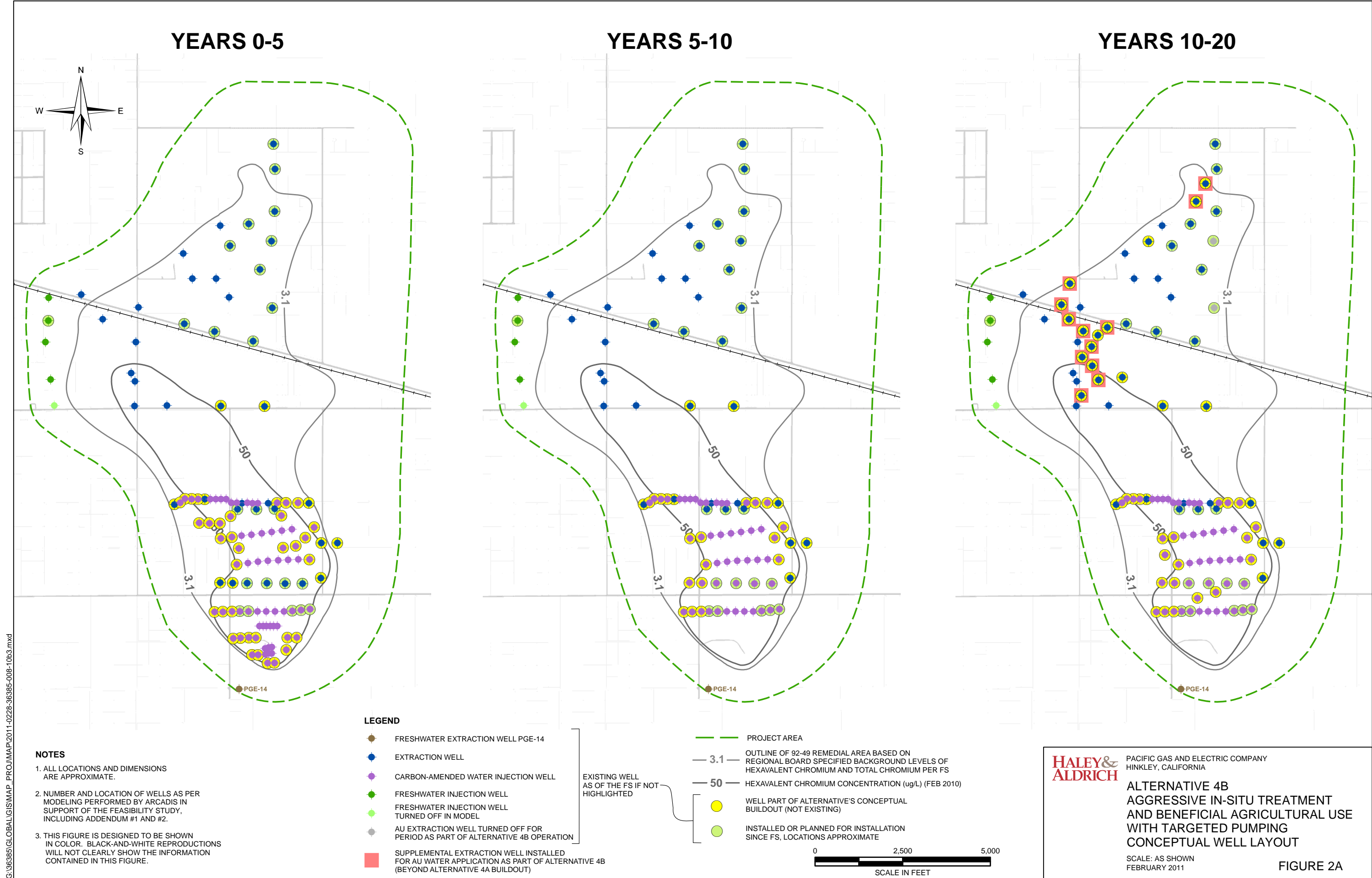
● 50 ug/L  
 ● 3.1 ug/L  
 ◆ 1.2 ug/L\*\*

Durations required to achieve the noted criteria. Durations were based on the time when the starting plume area (within the respective Cr(VI) contour interval) is reduced by 99 percent in model Layers 1 and 3 (based on the modeling of alternatives).  
 \*\* to the extent achieving this criteria is feasible

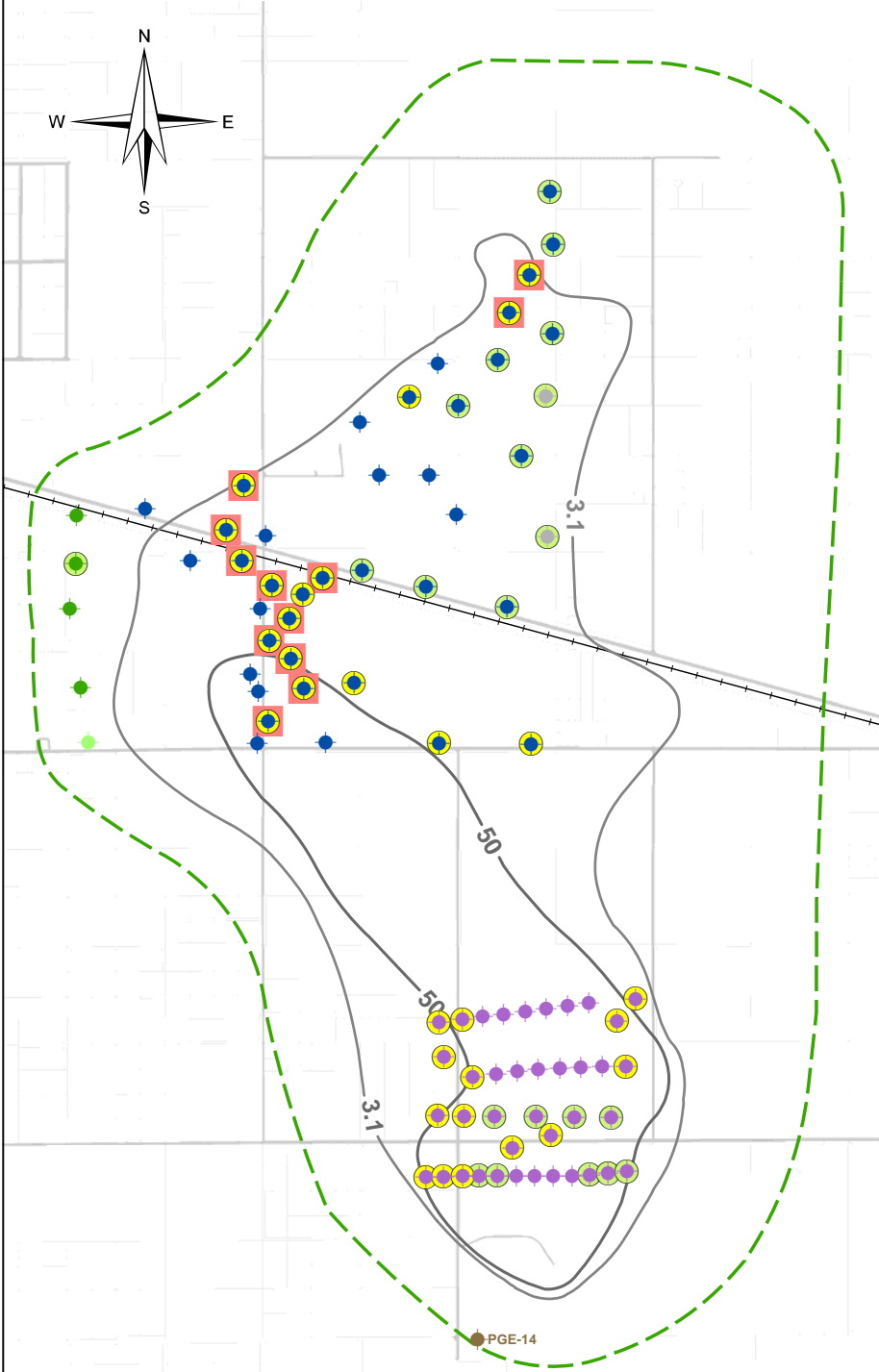
● \$153M Net present value (NPV) cost est. in millions (M) to reach criteria (rounded)

Figure 1





YEARS 20+



NOTES

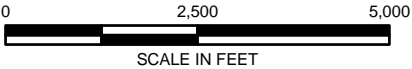
- 1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
- 2. NUMBER AND LOCATION OF WELLS AS PER MODELING PERFORMED BY ARCADIS IN SUPPORT OF THE FEASIBILITY STUDY, INCLUDING ADDENDUM #1 AND #2.
- 3. THIS FIGURE IS DESIGNED TO BE SHOWN IN COLOR. BLACK-AND-WHITE REPRODUCTIONS WILL NOT CLEARLY SHOW THE INFORMATION CONTAINED IN THIS FIGURE.

LEGEND

- FRESHWATER EXTRACTION WELL PGE-14
- EXTRACTION WELL
- CARBON-AMENDED WATER INJECTION WELL
- FRESHWATER INJECTION WELL
- FRESHWATER INJECTION WELL TURNED OFF IN MODEL
- AU EXTRACTION WELL TURNED OFF FOR PERIOD AS PART OF ALTERNATIVE 4B OPERATION
- SUPPLEMENTAL EXTRACTION WELL INSTALLED FOR AU WATER APPLICATION AS PART OF ALTERNATIVE 4B (BEYOND ALTERNATIVE 4A BUILDOUT)

EXISTING WELL AS OF THE FS IF NOT HIGHLIGHTED

- PROJECT AREA
- 3.1 OUTLINE OF 92-49 REMEDIAL AREA BASED ON REGIONAL BOARD SPECIFIED BACKGROUND LEVELS OF HEXAVALENT CHROMIUM AND TOTAL CHROMIUM PER FS
- 50 HEXAVALENT CHROMIUM CONCENTRATION (ug/L) (FEB 2010)
- WELL PART OF ALTERNATIVE'S CONCEPTUAL BUILDOUT (NOT EXISTING)
- INSTALLED OR PLANNED FOR INSTALLATION SINCE FS, LOCATIONS APPROXIMATE



HALEY & ALDRICH

PACIFIC GAS AND ELECTRIC COMPANY  
HINKLEY, CALIFORNIA

ALTERNATIVE 4B  
AGGRESSIVE IN-SITU TREATMENT  
AND BENEFICIAL AGRICULTURAL USE  
WITH TARGETED PUMPING  
CONCEPTUAL WELL LAYOUT

SCALE: AS SHOWN  
FEBRUARY 2011

FIGURE 2B

## **APPENDIX A**

### **DETAILED EVALUATION OF ALTERNATIVE 4B**



The following section evaluates Alternative 4B relative to the requirements established in Resolution No. 92-49, Part III.C, and the derived Site-specific remedial objectives (ROs) defined in Section 5 of the FS (Haley & Aldrich, 2010a). A selected alternative is required to satisfy the following key criteria: effectiveness, feasibility (implementability), and cost. The ROs defined in Section 5 of the FS are all included within the effectiveness criterion. This section discusses how Alternative 4B performs relative to these three key FS evaluation criteria.

## Effectiveness

Alternative 4B applies the same combination of technologies as Alternative 4A of Addendum #1, including a more aggressive approach than Alternative 4, with additional infrastructure and longer in situ treatment operation. Alternative 4B varies from Alternative 4A after year 10 when additional extraction wells are installed within the plume in areas slow to respond to cleanup efforts based on modeling of Alternative 4A. These additional operational modifications should enable the Alternative 4B to reach the ROs in a shorter timeframe than the alternatives presented in the FS and Addendum #1. The following is a discussion of how Alternative 4B performs relative to the four measures of effectiveness.

- *Cleanup to Background Conditions for Chromium:* Alternative 4B is similar to Alternative 4A in its initial configuration. However, Alternative 4B relies on targeted extraction<sup>1</sup> within the SCRIA extraction, DVD AU extraction, and Gorman extraction areas after year 10. This change along with other modifications associated with Alternative 4B results in a 110 year reduction in the cleanup time frame to achieve background conditions relative to Alternative 4 and a 35 year reduction relative to Alternative 4A. Targeted extraction in Alternative 4B is located in recalcitrant areas identified in Alternative 4A groundwater modeling to reduce the remedy timeframe. Alternative 4B exhibits a moderate likelihood of achieving this criterion.
- *Restore Beneficial Use:* Like Alternative 4A, Alternative 4B combines AUs and IRZs to contain the plume, reduce hexavalent chromium (Cr[VI]) concentrations/mass, and reduce the Cr(VI) footprint. Aggressive IRZ treatment in the plume core reduces Cr(VI) mass, which helps achieve the chromium MCL remedial objective, and restore beneficial use as quickly as possible. Note that similar to Alternative 4A, use of IRZ treatment within the plume core for Alternative 4B will result in the localized formation of dissolved iron, manganese, and/or arsenic byproducts. Byproduct concentrations may at times exceed drinking water standards. While these byproducts are not expected to persist in the aquifer, they will reduce the beneficial use of groundwater while they are present at concentrations that exceed drinking water standards.
- *Chromium Plume Containment:* Alternative 4B involves a similar level of overall hydraulic containment as Alternative 4A; the flow in the plume toe area is consistent between these two alternatives, but the configuration is modified over time to reduce the remedy duration. The groundwater extraction configuration remains the same as Alternative 4A during the first 10 years of operation, but is adjusted after year 10 when 12 new extraction wells are installed within recalcitrant portions of the SCRIA extraction, DVD AU extraction, and Gorman AU extraction areas. The 12 new targeted extraction wells will provide 100 gpm of withdrawal for application on AUs located in the distal portion of the plume; this flow replaces 100 gpm from

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<sup>1</sup> It should be noted that the targeted extraction noted above replaces two existing extraction wells; the rest of the existing wells will continue to operate unless otherwise indicated.

two existing extraction wells that will be shut down (Figure 2). Withdrawal of water associated with IRZ activities will occur in the plume core area, and will be amended with carbon and injected inside the plume to reduce plume mass and footprint, targeting areas of higher Cr(VI) concentration. Similar to the other alternatives presented, Alternative 4B includes the limited injection of clean groundwater into the northwest side of the plume, to enhance plume boundary control in that direction. In addition, three extraction wells would be located east of the SCRIA to improve plume capture and reduce cleanup duration. To evaluate the effectiveness of this alternative on plume containment, a groundwater fate and transport model was used to evaluate the plume containment characteristics. Modeling results indicate that Alternative 4B establishes robust hydraulic control over the plume boundaries, and is anticipated to effectively contain the plume.

- *Productive Use of Groundwater Resource:* Alternative 4B involves six AUs. Aggressive core treatment, targeted extraction in recalcitrant areas, combined with plume containment and agricultural application results in the highest productive use of groundwater for the alternatives considered. Through this treatment approach, Site groundwater would be used at its highest and best current productive use, agricultural application and fodder crop production. The agricultural application is also beneficial to water supply in the basin because it uses an already marginal or unusable resource (groundwater impacted by nitrate/TDS) for crop production, replacing the need for local farmers to import water for the same fodder crop.

## **Implementability**

Implementability is defined by how readily constructed and technically feasible the alternative is, considering Site-specific factors that may affect constructability, the technical complexity of the alternative, administrative feasibility (e.g., availability of property, permitting), availability of services and materials to implement the alternative, and other relevant considerations.

Alternative 4B is moderately easy to implement. It consists of the aggressive use of technologies that are already being used at the Site, and expands them into areas near existing treatment areas (DVD AU, Gorman AUs, Central Area IRZ, Source Area IRZ, and SCRIA IRZ). Similar to Alternative 4A, Alternative 4B combines major elements from Alternative 4 presented in the FS with a larger version of the Central Area IRZ program for plume core treatment, and the overall extension of the Central Area, SCRIA, and Source Area IRZ program operating durations. Like Alternative 4A, Alternative 4B capitalizes on a large portion of the existing infrastructure at the Site, though it involves even more expansion of certain remediation components by adding wells to improve groundwater extraction in certain areas of the plume toe that were recalcitrant to cleanup based on Alternative 4A groundwater modeling. Similar to other alternatives, potential challenges to implementing this alternative relate to access to non-PG&E owned property needed for extraction, injection, or water conveyance systems.

Similar to Alternative 4A, Alternative 4B is anticipated to consist of a modification to the General Permit. A modification/simplification of the agricultural treatment permit process, as well as a modification of the monitoring program consistent with the other agricultural application processes, is critical to implementation of this approach.

Overall, this alternative is moderately easy to implement.

## Costs

Consistent with the FS and Addendum #1, the development of representative costs for Alternative 4B utilized the United States Environmental Protection Agency guidance for preparing feasibility studies (USEPA 2000). Costing methods presented herein are consistent with the FS and its supplemental data submittal dated 14 October, 2010 (Haley & Aldrich, 2010a and b), and Addendum #1. Two life-cycle costs are provided for each alternative, one that is “discounted” to account for inflation and interest (as “net present value” [ NPV]) and one that is “non-discounted.” Quantities and unit costs were selected based on contractor experience at the Hinkley Site and at other sites with similar impacts and subsurface conditions. Primary assumptions or considerations that were taken into account in the preparation of the alternative costs include:

- Costs were based on 2010/2011 values;
- For the NPV costing scenario, future capital and O&M costs were adjusted using a discount value of 3.17 percent, which accounts for inflation;
- The non-discounted costing scenario assumes all costs are in today’s dollars;
- A 20 percent contingency was used on capital costs and a contingency of 10 percent was used on O&M costs, based on engineering judgment; and
- Remedy durations to meet the key remedial objectives for each alternative were estimated through the use of fate and transport modeling simulations, and were estimated based on the time when the starting plume area for the respective concentration value (e.g., 50  $\mu\text{g/L}$ , 3.1  $\mu\text{g/L}$ , and 1.2  $\mu\text{g/L}$ ) were reduced by 99 percent in Model Layers 1 and 3.

Based on these assumptions, the presented costs have an approximate expected accuracy range of -30 percent to +50 percent. Table 2 summarizes the estimated time frame to reach the 50  $\mu\text{g/L}$  chromium MCL, 80 percent mass removal, and background, as well as the non-discounted and discounted NPV cost estimate to reach background for Alternative 4B in addition to each of the alternatives presented in the FS and Addendum #1. Table 3 provides a cost breakdown based on the area and remedy type for each alternative. In summary, the resultant estimated life cycle costs for Alternative 4B to achieve background are:

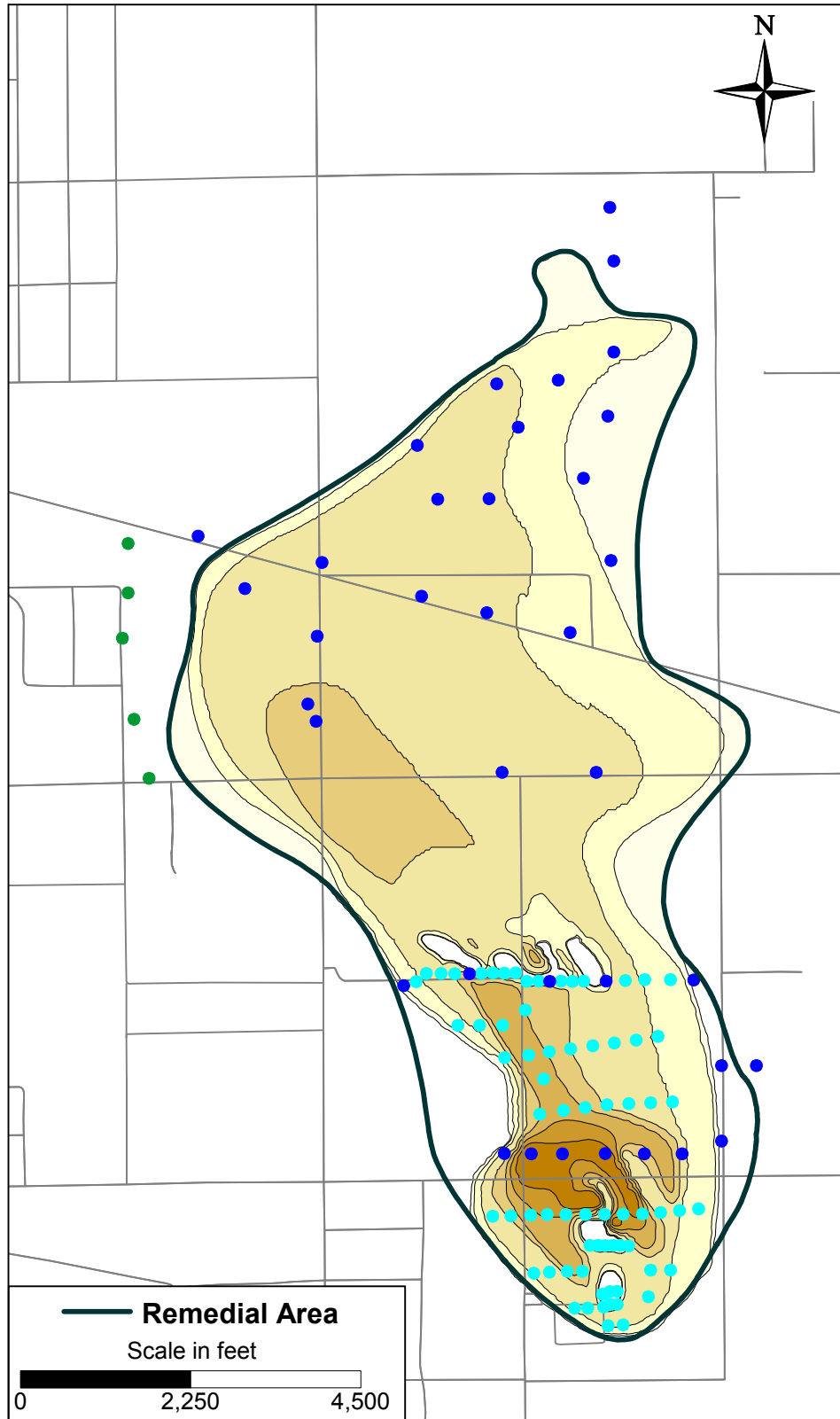
- \$109M (non-discounted) and \$75.9M NPV (discounted)

## REFERENCES

1. Haley & Aldrich, Inc. 2010a. Feasibility Study, Pacific Gas and Electric Company, Hinkley Compressor Station, Hinkley, California. 30 August.
2. Haley & Aldrich, Inc. 2010b. Hinkley Feasibility Study Supplemental Data Submittal. 14 October.
3. Pacific Gas and Electric Company (PG&E). 2010. Addendum #1 to the Feasibility Study, Pacific Gas and Electric Company, Hinkley Compressor Station, Hinkley, California. 31 January.
4. United States Environmental Protection Agency (USEPA)/Army Corps of Engineers. 2000. A Guide to Developing and Documenting Cost Estimates During the Feasibility Study. EPA 540-R-00-002, OSWER 9355.0-75. July.

## **APPENDIX B**

### **GROUNDWATER MODELING OUTPUT FOR ALTERNATIVE 4B**



Remedial Area

Scale in feet

0 2,250 4,500

Chromium Concentration (ug/L)



3.7 7 10 50 100 250 500

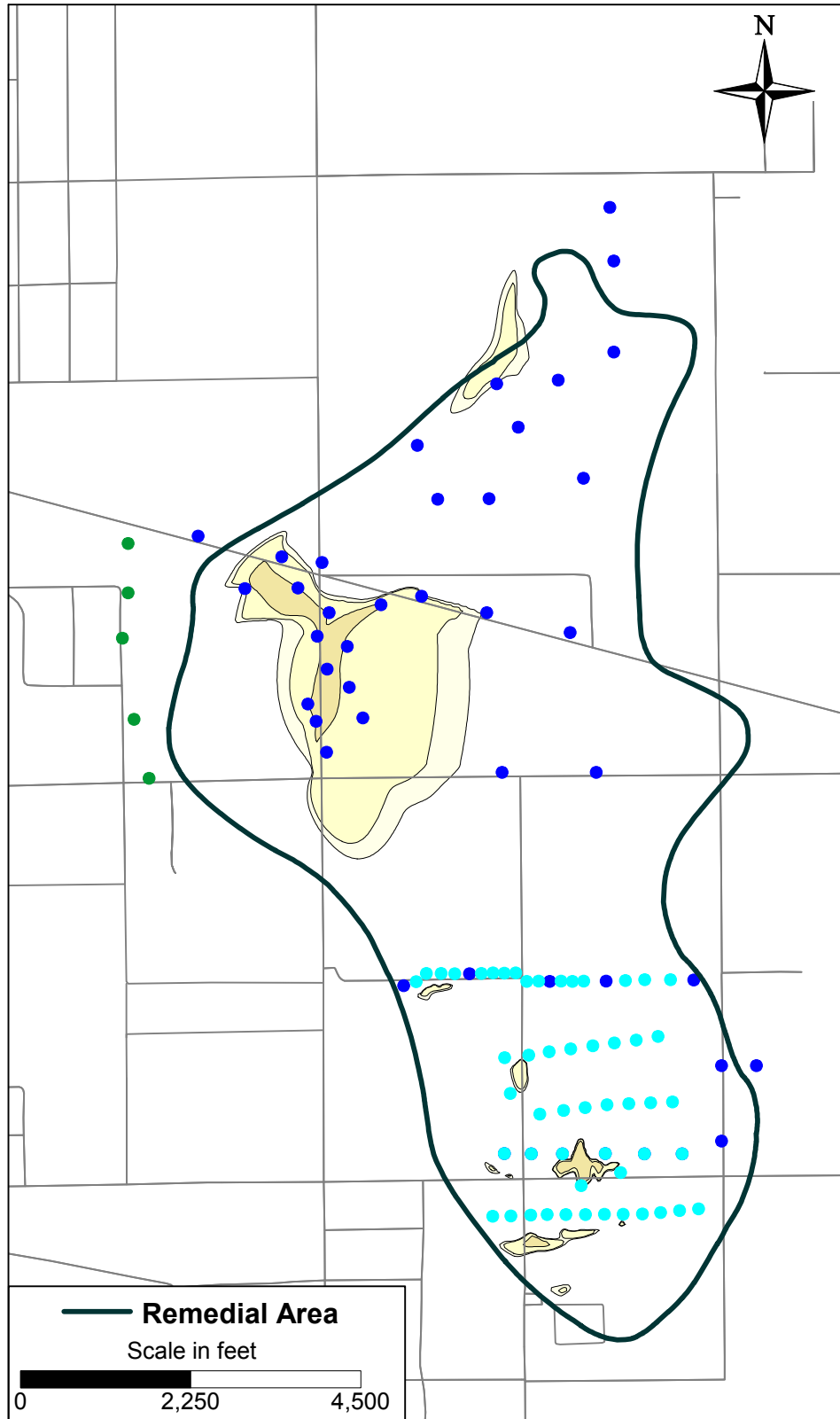
- Approximate Location of Extraction Well
- Approximate Location of Carbon-Amended Injection Well
- Approximate Location of Freshwater Injection Well

PG&E  
HINKLEY, CALIFORNIA  
MODELING APPENDIX

INITIALIZED CHROMIUM CONCENTRATIONS  
IN MODEL LAYER 1



ALTERNATIVE  
4B



Chromium Concentration (ug/L)



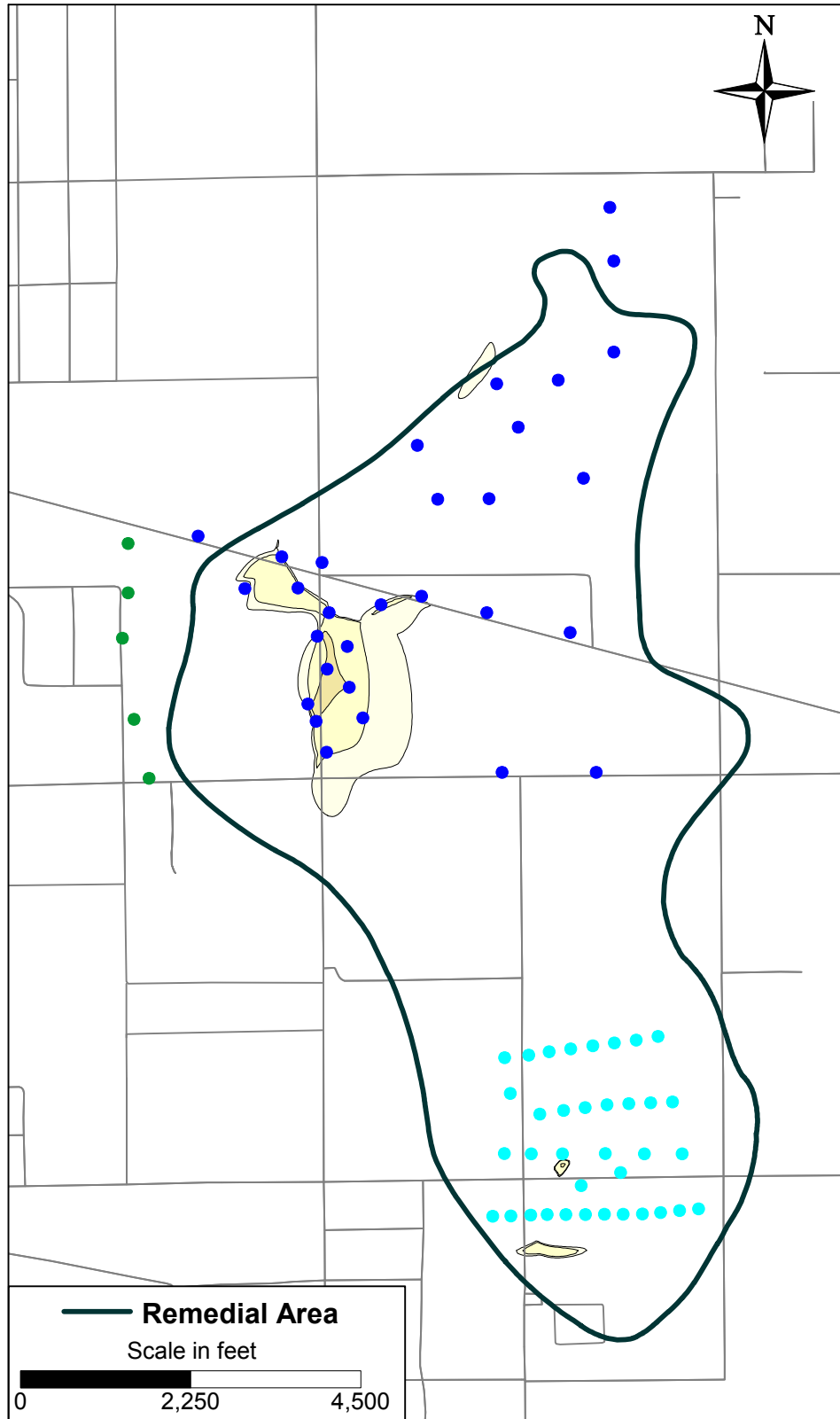
- Approximate Location of Extraction Well
- Approximate Location of Carbon-Amended Injection Well
- Approximate Location of Freshwater Injection Well

PG&E  
HINKLEY, CALIFORNIA  
MODELING APPENDIX

SIMULATED CHROMIUM CONCENTRATIONS  
IN MODEL LAYER 1  
AFTER 10 YEARS OF REMEDIATION



ALTERNATIVE  
**4B**



Chromium Concentration (ug/L)



3.7

7

10

50

100

250

500

- Approximate Location of Extraction Well
- Approximate Location of Carbon-Amended Injection Well
- Approximate Location of Freshwater Injection Well

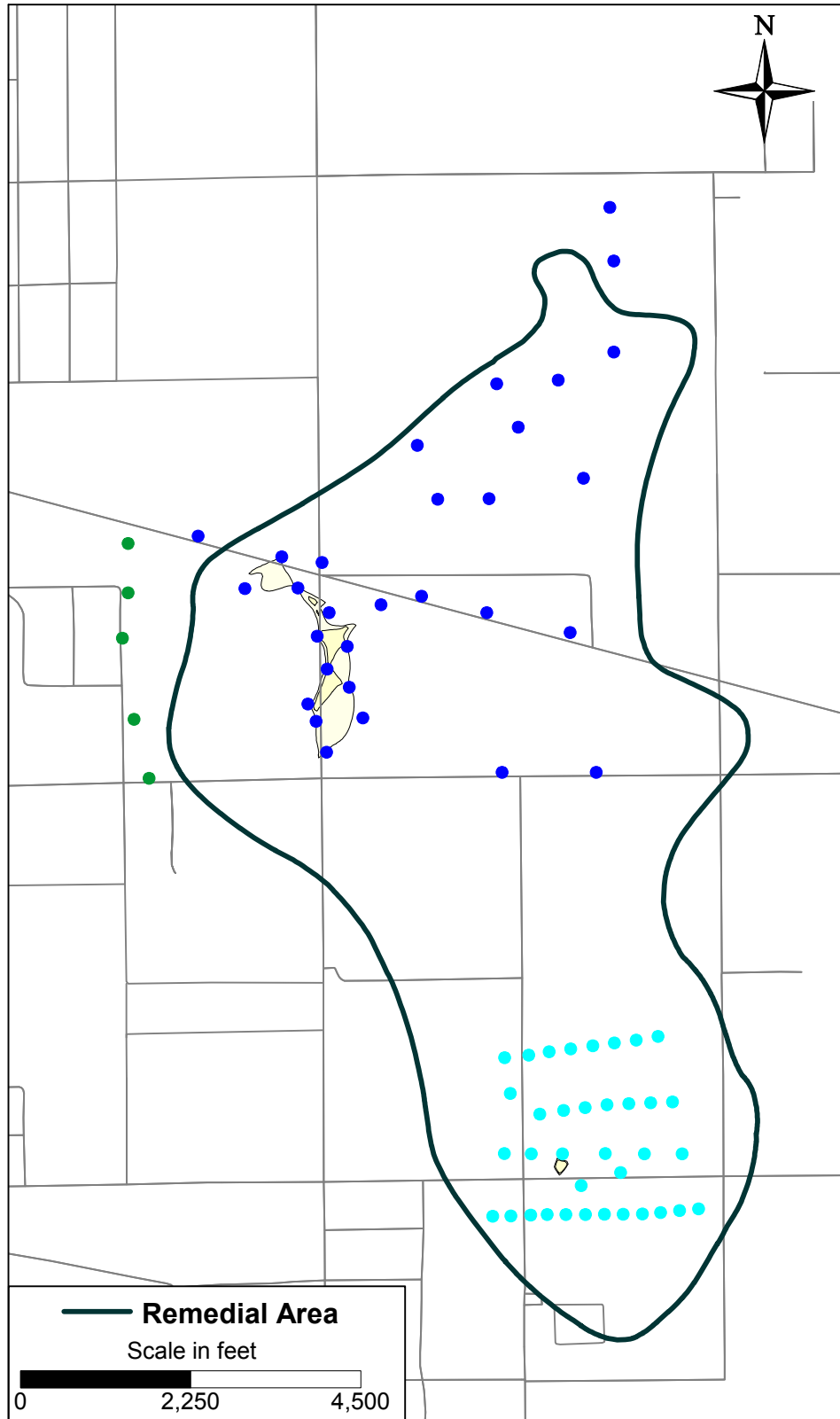
PG&E  
HINKLEY, CALIFORNIA  
MODELING APPENDIX

SIMULATED CHROMIUM CONCENTRATIONS  
IN MODEL LAYER 1  
AFTER 20 YEARS OF REMEDIATION



ALTERNATIVE  
4B





Chromium Concentration (ug/L)



0.7

1

10

50

100

250

500

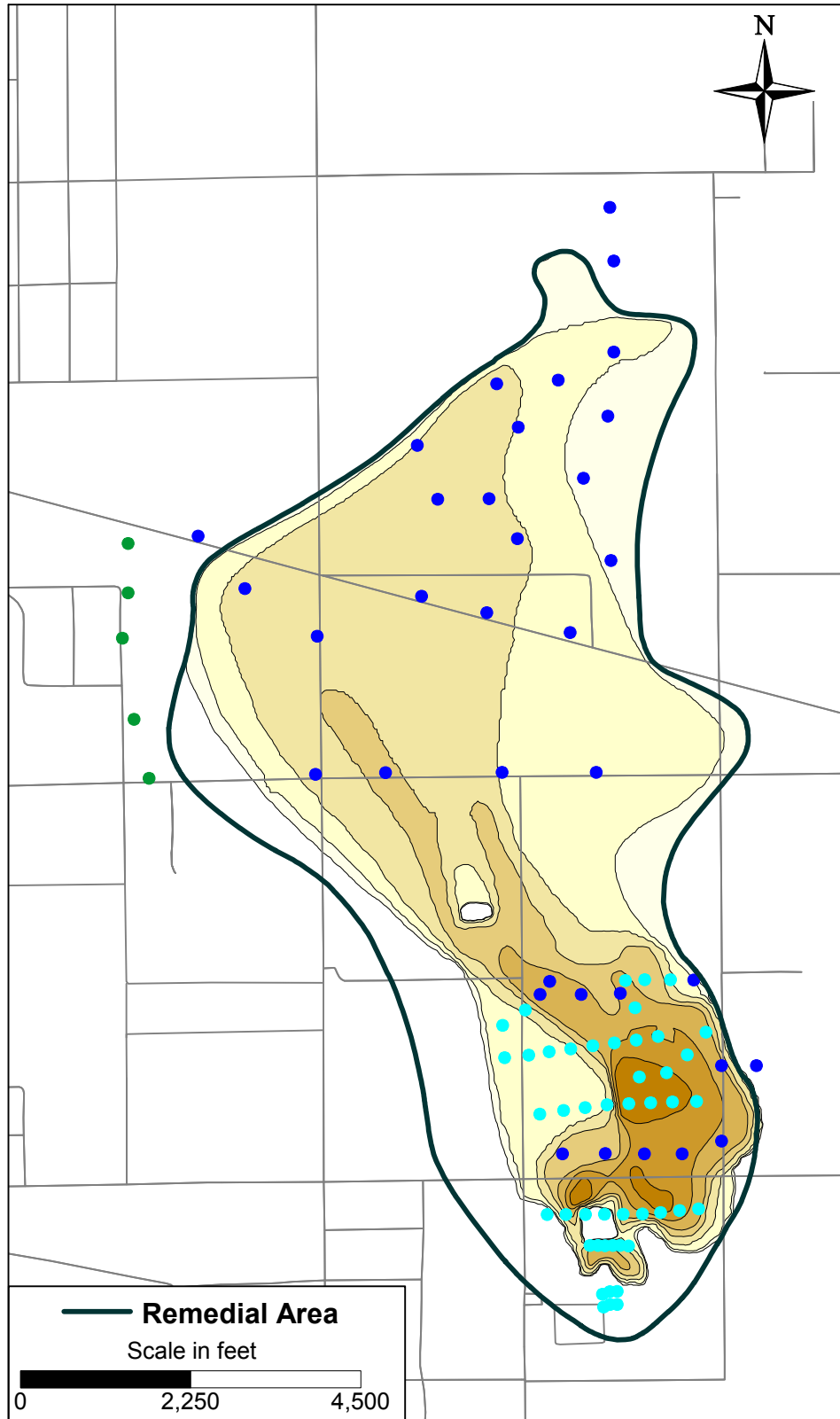
- Approximate Location of Extraction Well
- Approximate Location of Carbon-Amended Injection Well
- Approximate Location of Freshwater Injection Well

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HINKLEY, CALIFORNIA  
MODELING APPENDIX

SIMULATED CHROMIUM CONCENTRATIONS  
IN MODEL LAYER 1  
AFTER 40 YEARS OF REMEDIATION



ALTERNATIVE  
**4B**



Chromium Concentration (ug/L)



3.7

7

10

50

100

250

500

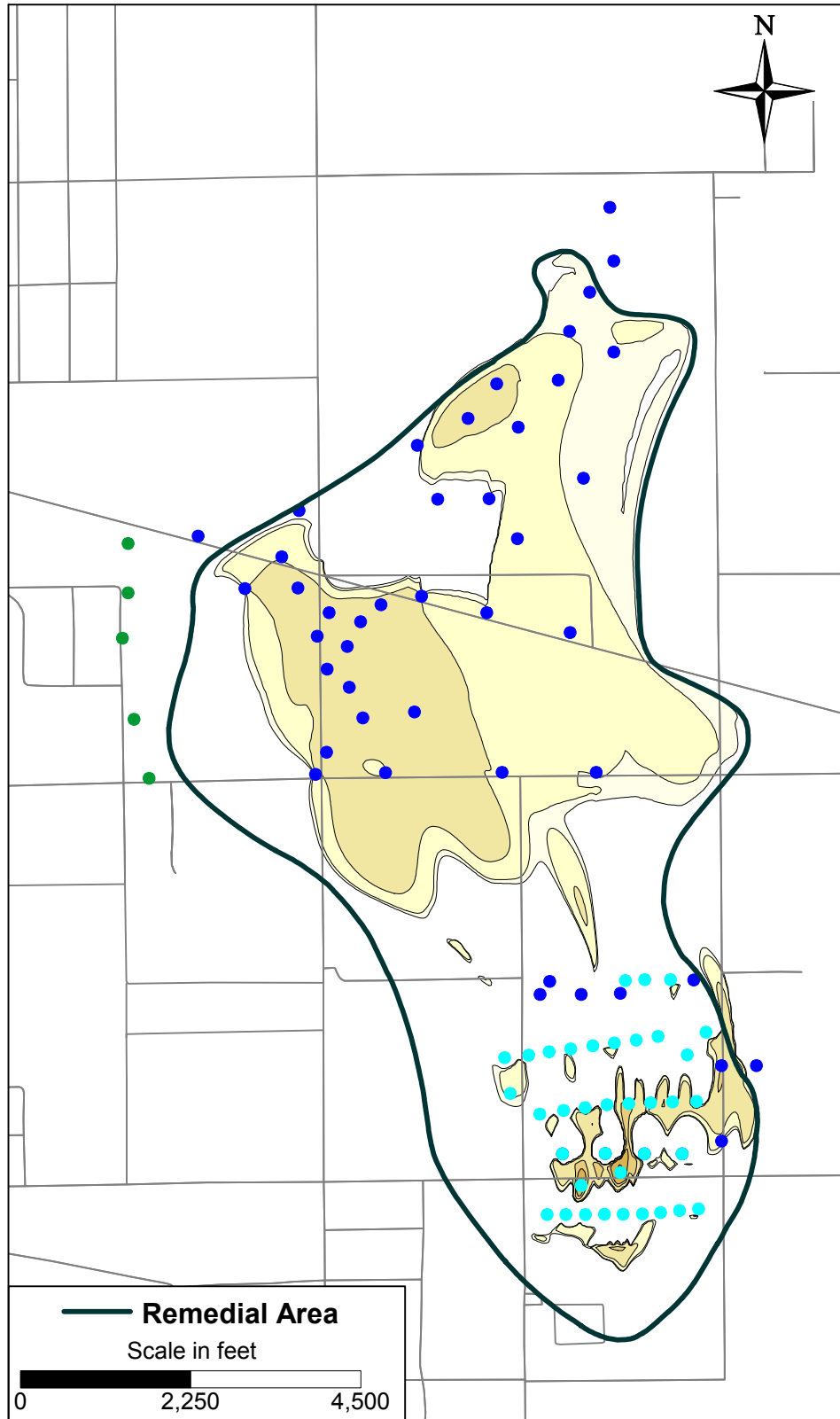
- Approximate Location of Extraction Well
- Approximate Location of Carbon-Amended Injection Well
- Approximate Location of Freshwater Injection Well

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MODELING APPENDIX

INITIALIZED CHROMIUM CONCENTRATIONS  
IN MODEL LAYER 2



ALTERNATIVE  
**4B**



**Remedial Area**

Scale in feet

0 2,250 4,500

Chromium Concentration (ug/L)



0.7

1

10

50

100

250

500

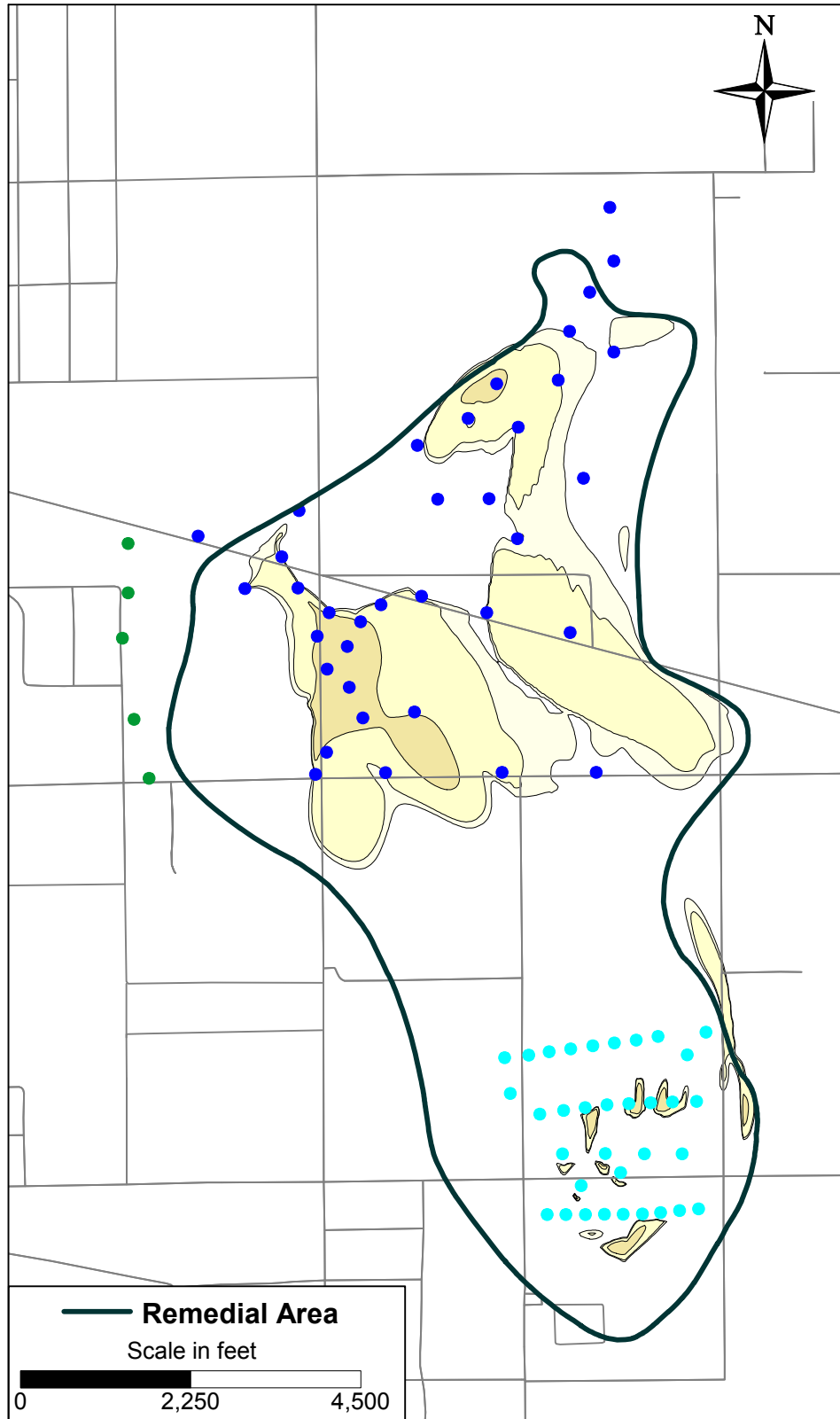
- Approximate Location of Extraction Well
- Approximate Location of Carbon-Amended Injection Well
- Approximate Location of Freshwater Injection Well

PG&E  
HINKLEY, CALIFORNIA  
MODELING APPENDIX

**SIMULATED CHROMIUM CONCENTRATIONS  
IN MODEL LAYER 2  
AFTER 10 YEARS OF REMEDIATION**



ALTERNATIVE  
**4B**



Chromium Concentration (ug/L)



3.7

7

10

50

100

250

500

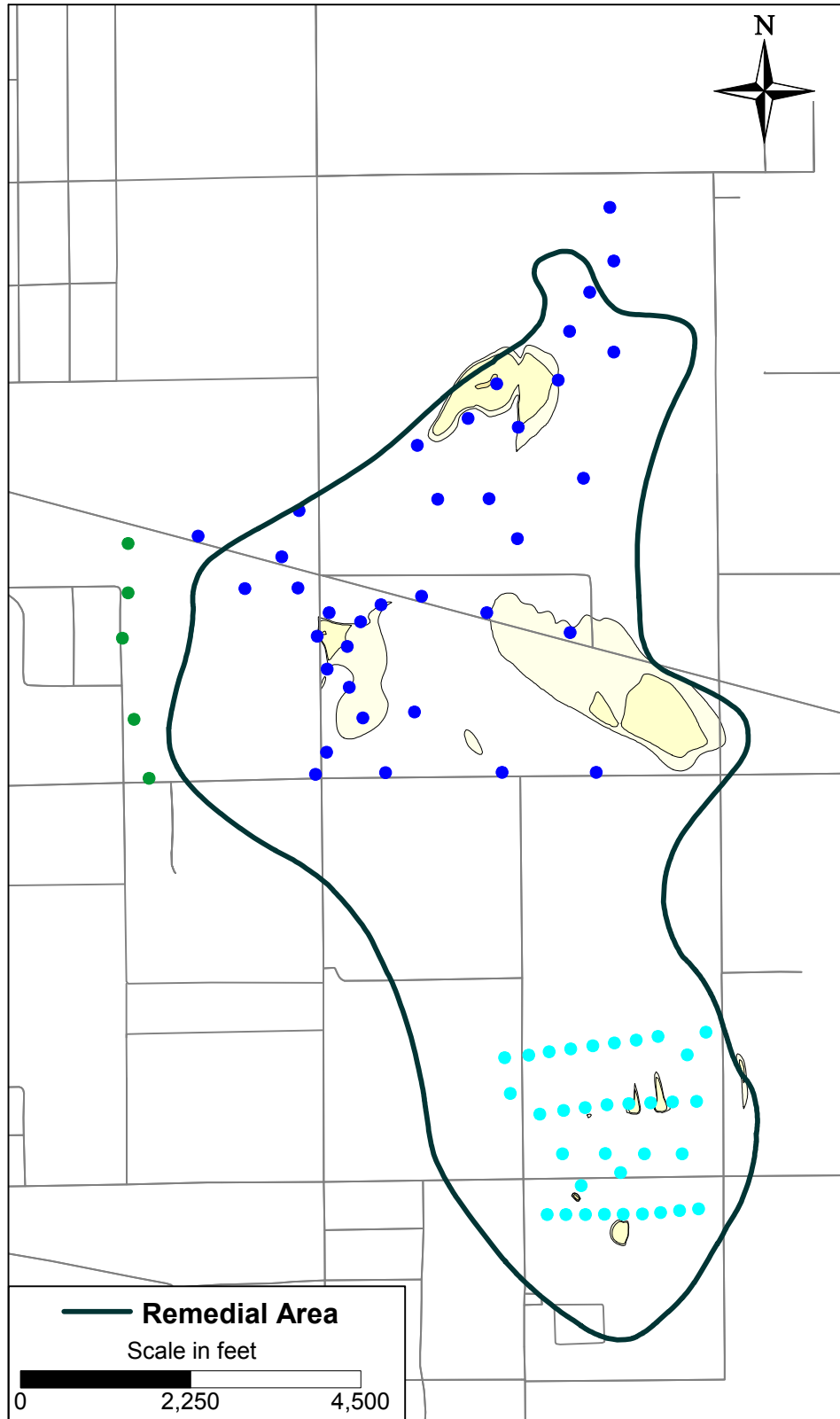
- Approximate Location of Extraction Well
- Approximate Location of Carbon-Amended Injection Well
- Approximate Location of Freshwater Injection Well

PG&E  
HINKLEY, CALIFORNIA  
MODELING APPENDIX

SIMULATED CHROMIUM CONCENTRATIONS  
IN MODEL LAYER 2  
AFTER 20 YEARS OF REMEDIATION



ALTERNATIVE  
**4B**



Chromium Concentration (ug/L)



0.7

1

10

50

100

250

500

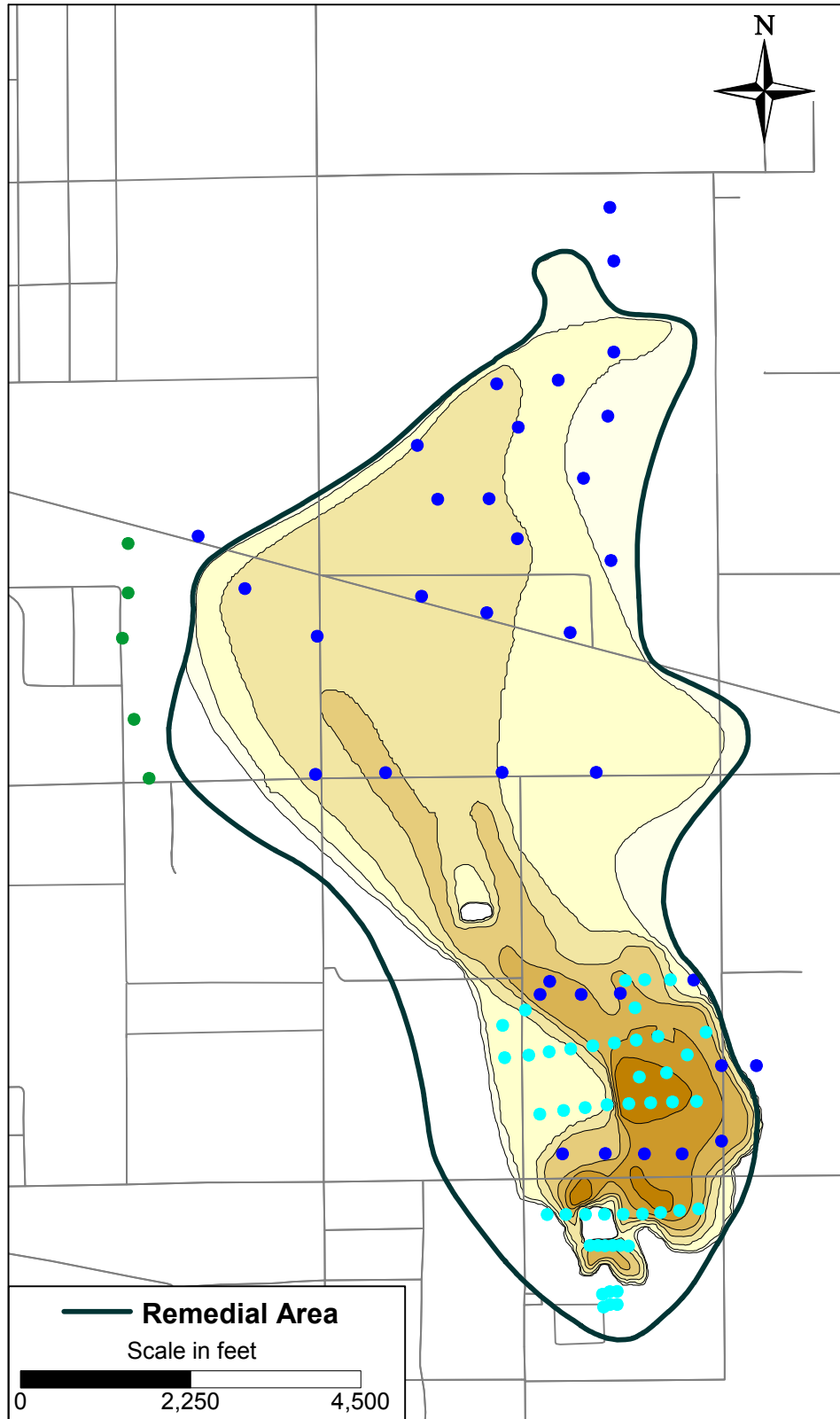
- Approximate Location of Extraction Well
- Approximate Location of Carbon-Amended Injection Well
- Approximate Location of Freshwater Injection Well

PG&E  
HINKLEY, CALIFORNIA  
MODELING APPENDIX

SIMULATED CHROMIUM CONCENTRATIONS  
IN MODEL LAYER 2  
AFTER 40 YEARS OF REMEDIATION



ALTERNATIVE  
**4B**



Chromium Concentration (ug/L)



3.7

7

10

50

100

250

500

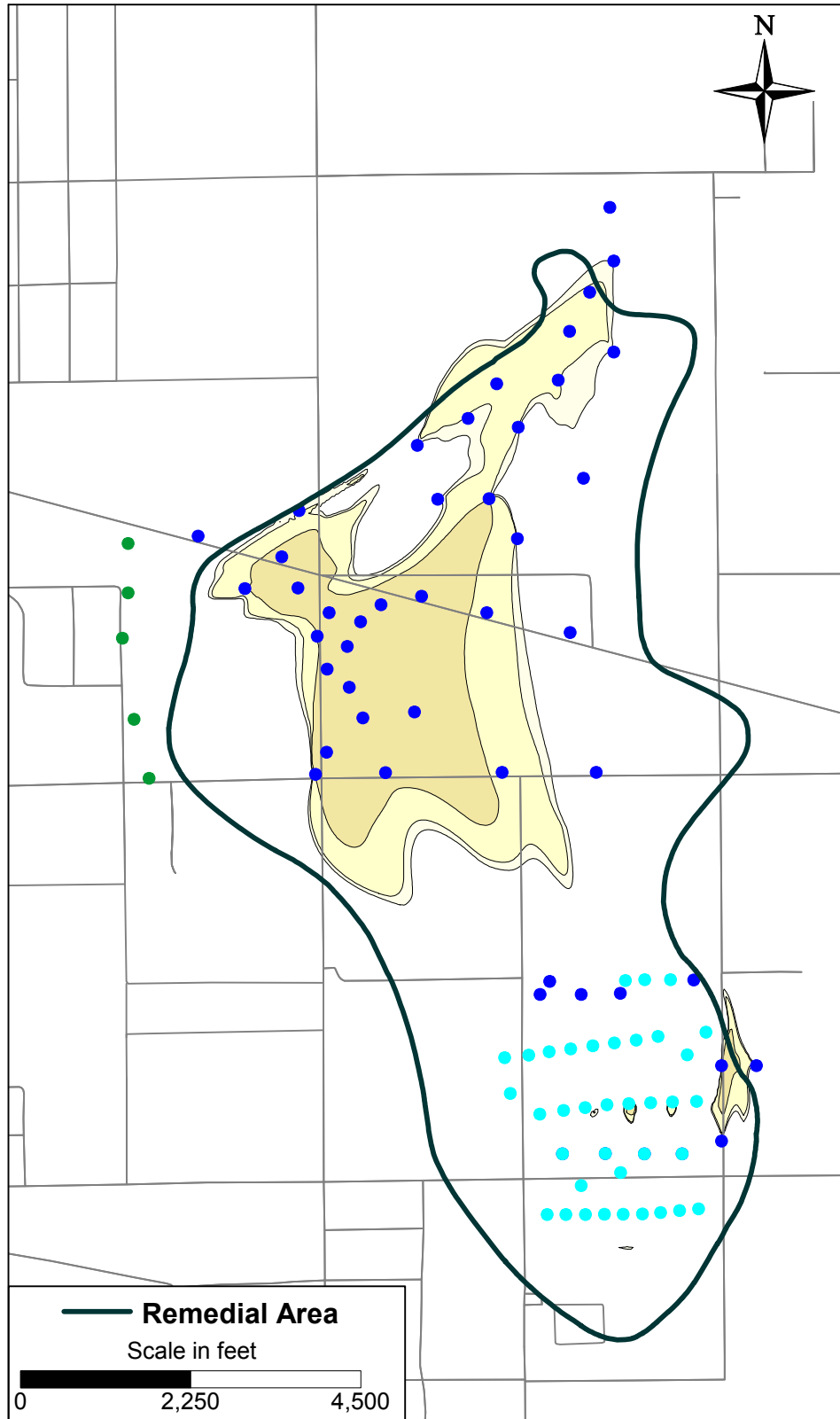
- Approximate Location of Extraction Well
- Approximate Location of Carbon-Amended Injection Well
- Approximate Location of Freshwater Injection Well

PG&E  
HINKLEY, CALIFORNIA  
MODELING APPENDIX

INITIALIZED CHROMIUM CONCENTRATIONS  
IN MODEL LAYER 3



ALTERNATIVE  
**4B**



Chromium Concentration (ug/L)



3.7

7

10

50

100

250

500

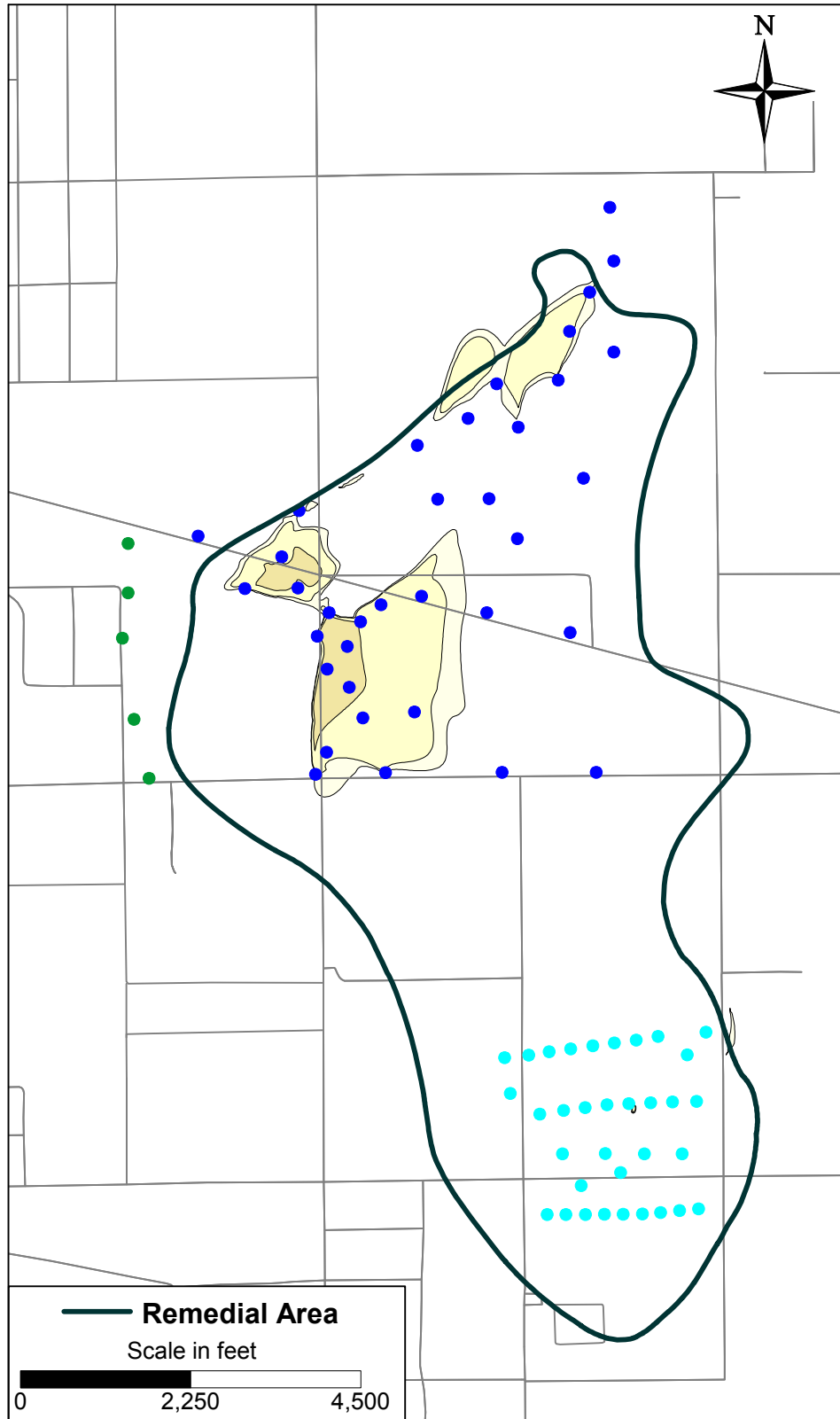
- Approximate Location of Extraction Well
- Approximate Location of Carbon-Amended Injection Well
- Approximate Location of Freshwater Injection Well

PG&E  
HINKLEY, CALIFORNIA  
MODELING APPENDIX

SIMULATED CHROMIUM CONCENTRATIONS  
IN MODEL LAYER 3  
AFTER 10 YEARS OF REMEDIATION



ALTERNATIVE  
4B



Chromium Concentration (ug/L)



0.7

1

10

50

100

250

500

- Approximate Location of Extraction Well
- Approximate Location of Carbon-Amended Injection Well
- Approximate Location of Freshwater Injection Well

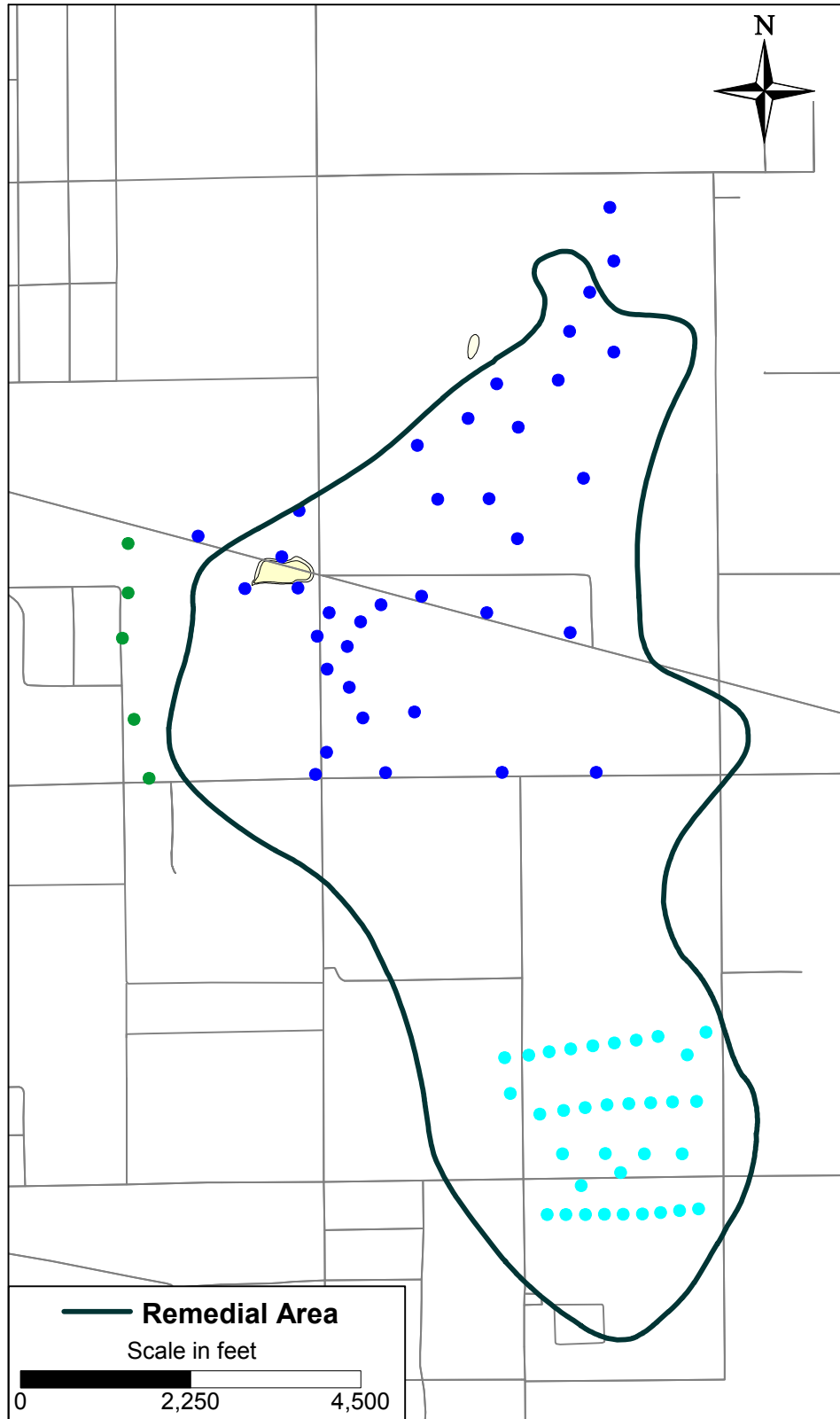
PG&E  
HINKLEY, CALIFORNIA  
MODELING APPENDIX

SIMULATED CHROMIUM CONCENTRATIONS  
IN MODEL LAYER 3  
AFTER 20 YEARS OF REMEDIATION



ALTERNATIVE  
4B





Chromium Concentration (ug/L)



3.7

7

10

50

100

250

500

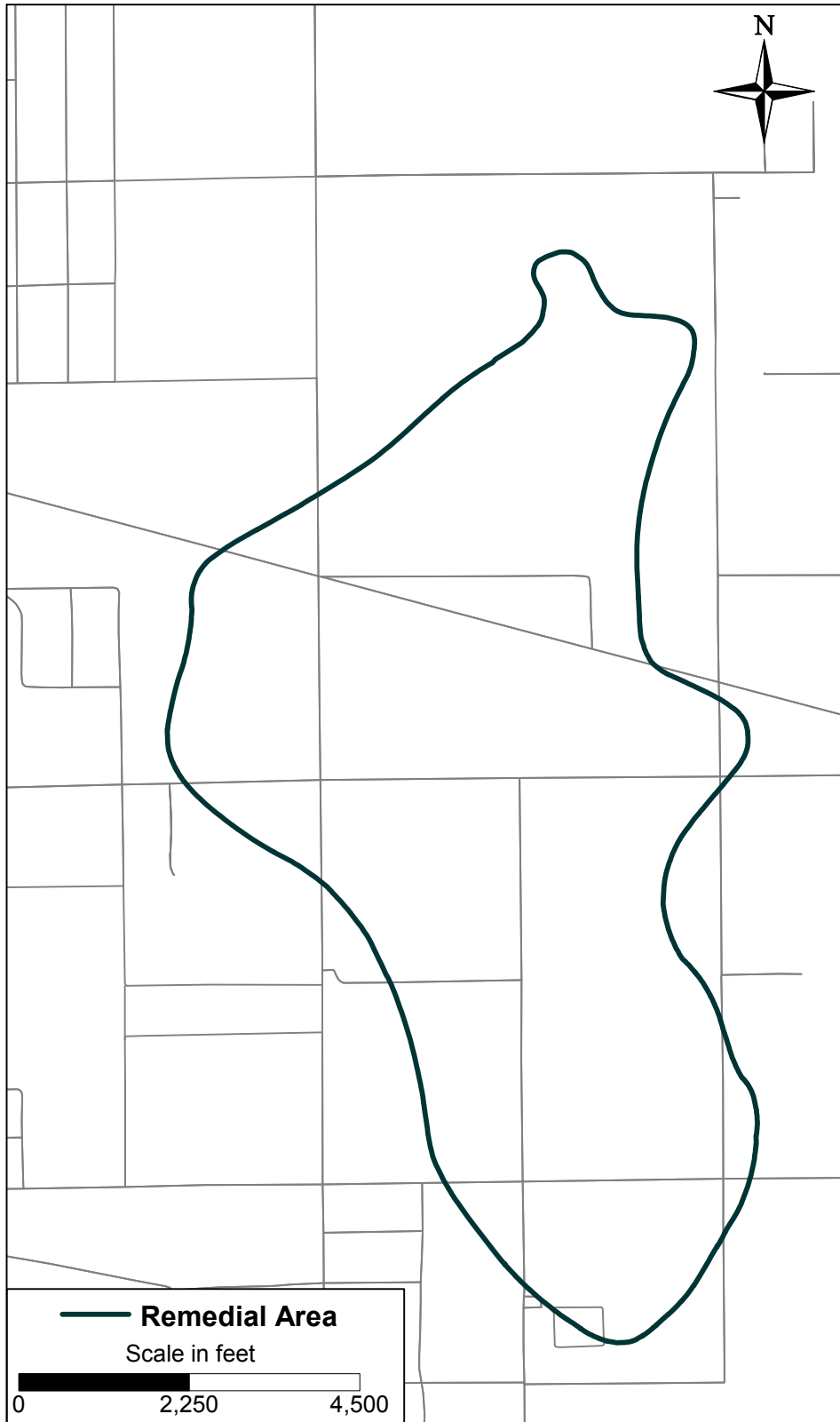
- Approximate Location of Extraction Well
- Approximate Location of Carbon-Amended Injection Well
- Approximate Location of Freshwater Injection Well

PG&E  
HINKLEY, CALIFORNIA  
MODELING APPENDIX

SIMULATED CHROMIUM CONCENTRATIONS  
IN MODEL LAYER 3  
AFTER 40 YEARS OF REMEDIATION



ALTERNATIVE  
**4B**



Chromium Concentration (ug/L)



3.7

7

10

50

100

250

500

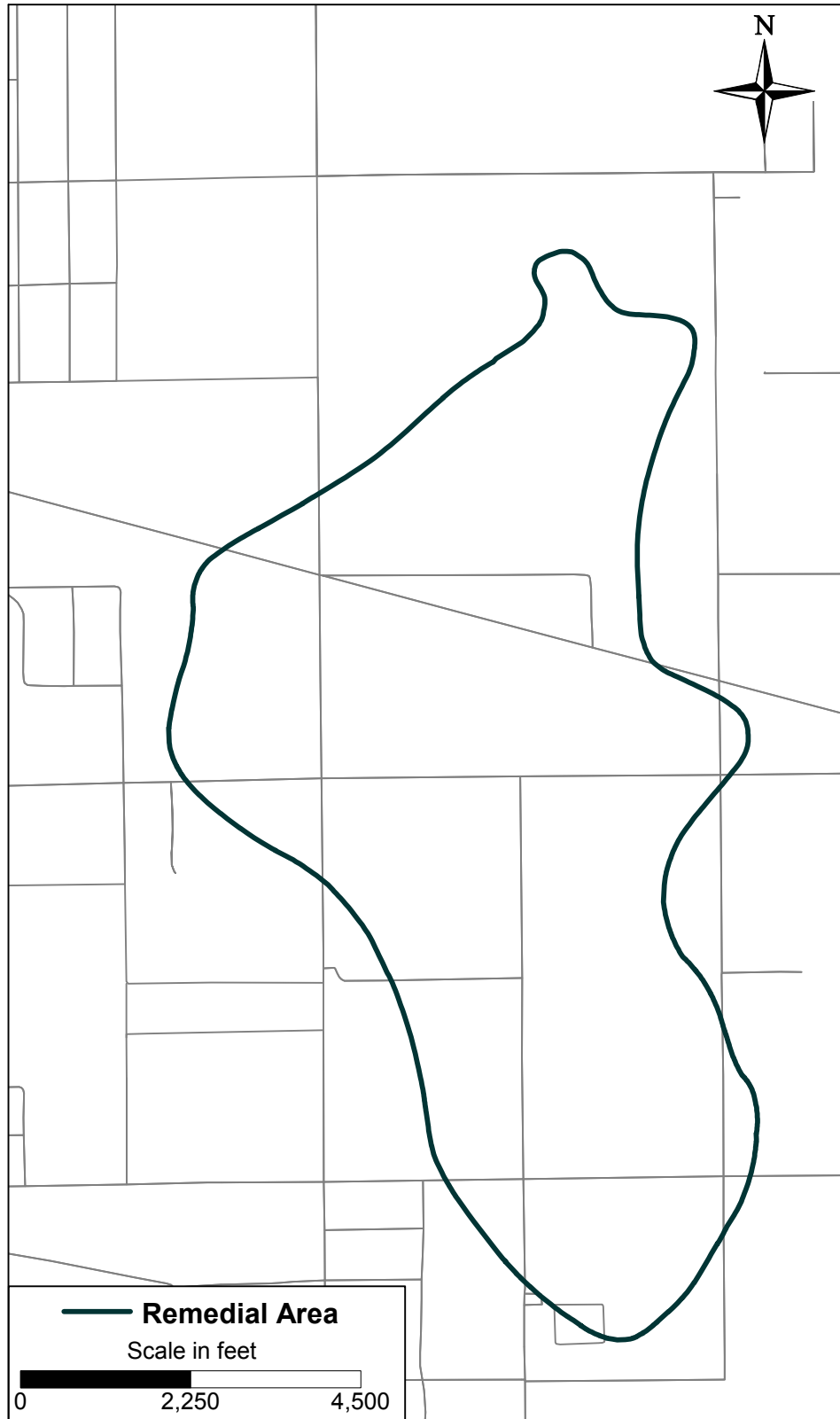
- Approximate Location of Extraction Well
- Approximate Location of Carbon-Amended Injection Well
- Approximate Location of Freshwater Injection Well

PG&E  
HINKLEY, CALIFORNIA  
MODELING APPENDIX

INITIALIZED CHROMIUM CONCENTRATIONS  
IN MODEL LAYER 4



ALTERNATIVE  
**4B**



Chromium Concentration (ug/L)



0.7

1

10

50

100

250

500

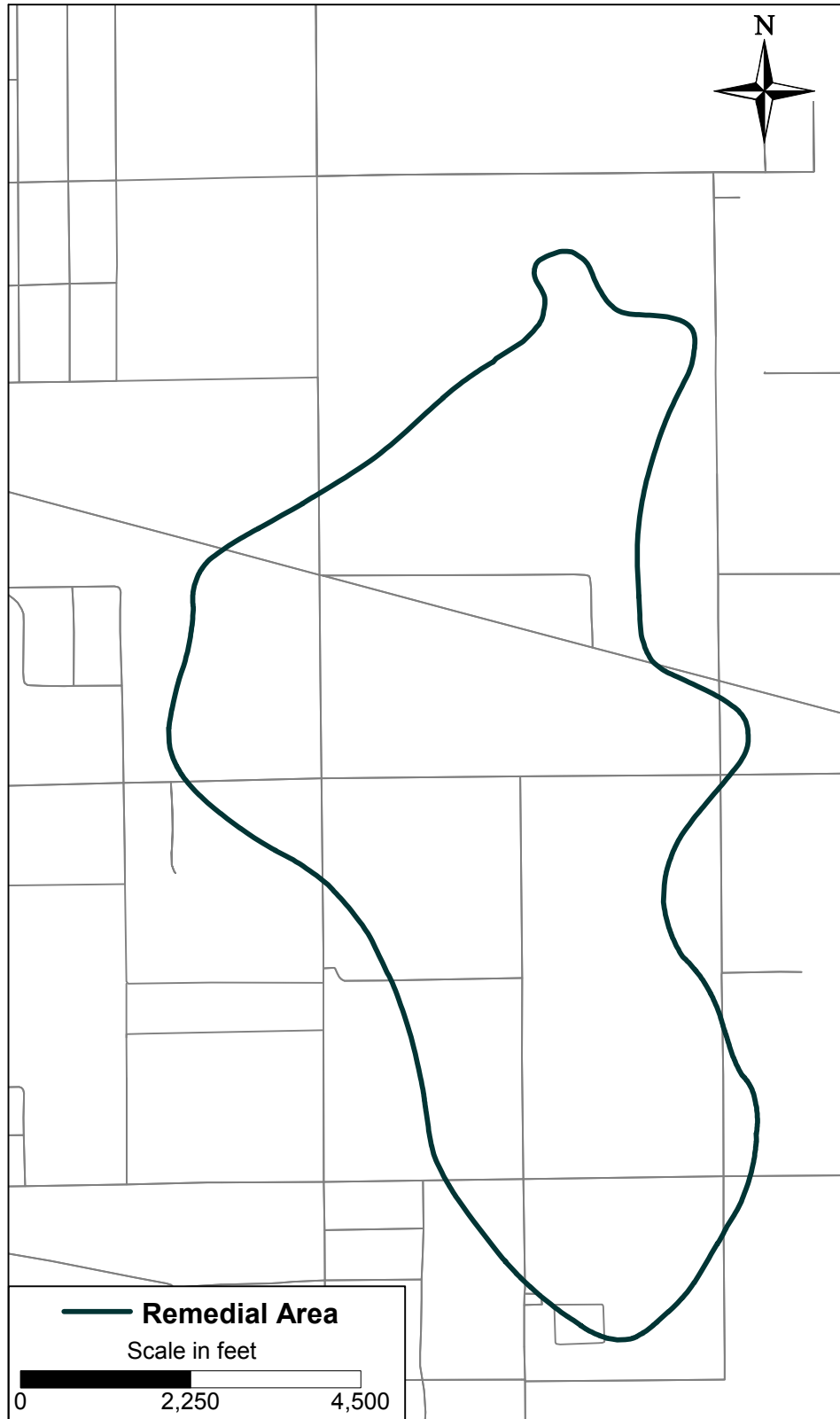
- Approximate Location of Extraction Well
- Approximate Location of Carbon-Amended Injection Well
- Approximate Location of Freshwater Injection Well

PG&E  
HINKLEY, CALIFORNIA  
MODELING APPENDIX

SIMULATED CHROMIUM CONCENTRATIONS  
IN MODEL LAYER 4  
AFTER 10 YEARS OF REMEDIATION



ALTERNATIVE  
**4B**



Chromium Concentration (ug/L)



0.7

1

10

50

100

250

500

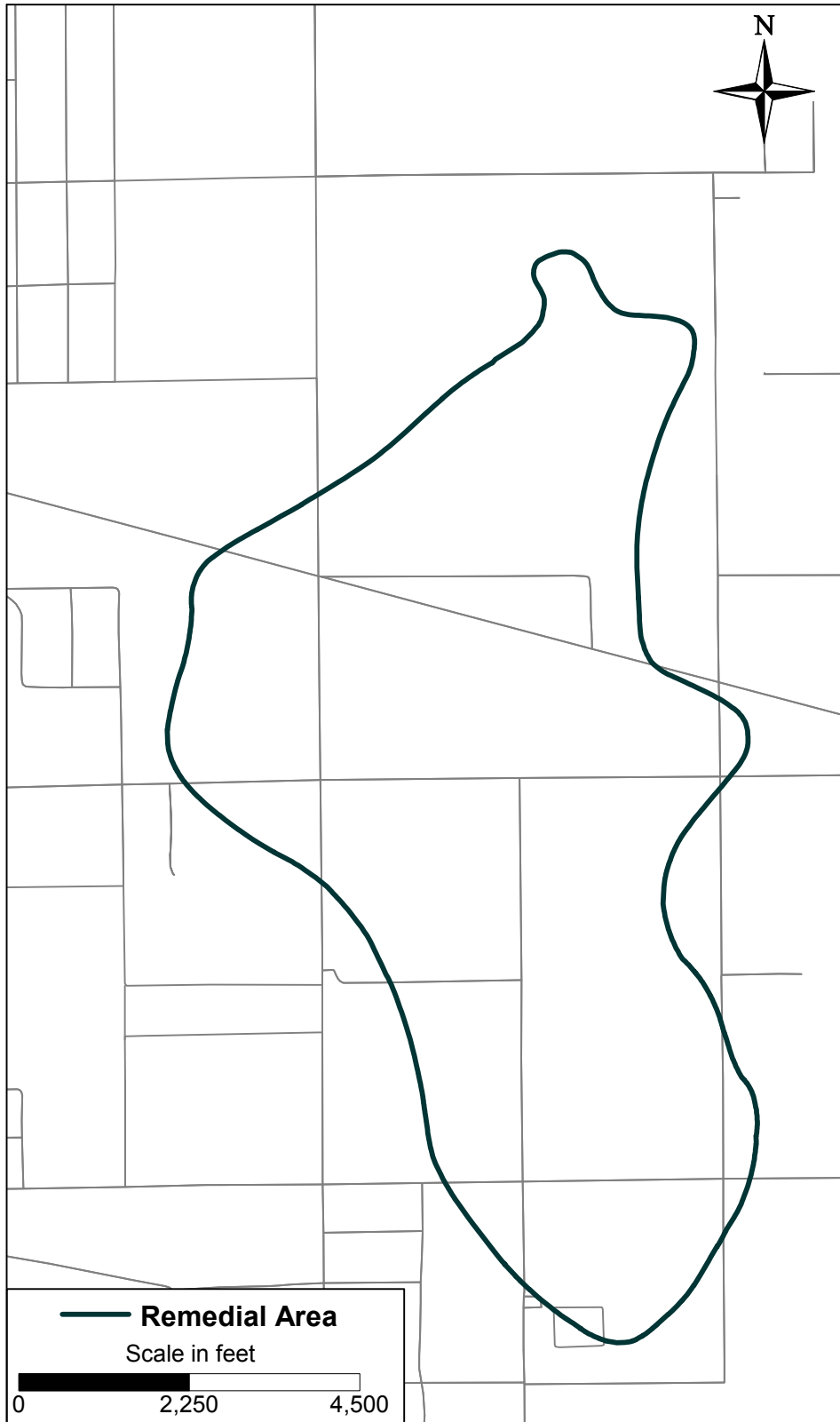
- Approximate Location of Extraction Well
- Approximate Location of Carbon-Amended Injection Well
- Approximate Location of Freshwater Injection Well

PG&E  
HINKLEY, CALIFORNIA  
MODELING APPENDIX

SIMULATED CHROMIUM CONCENTRATIONS  
IN MODEL LAYER 4  
AFTER 20 YEARS OF REMEDIATION



ALTERNATIVE  
**4B**



Chromium Concentration (ug/L)



0.7

1

10

50

100

250

500

- Approximate Location of Extraction Well
- Approximate Location of Carbon-Amended Injection Well
- Approximate Location of Freshwater Injection Well

PG&E  
HINKLEY, CALIFORNIA  
MODELING APPENDIX

SIMULATED CHROMIUM CONCENTRATIONS  
IN MODEL LAYER 4  
AFTER 40 YEARS OF REMEDIATION



ALTERNATIVE  
**4B**